

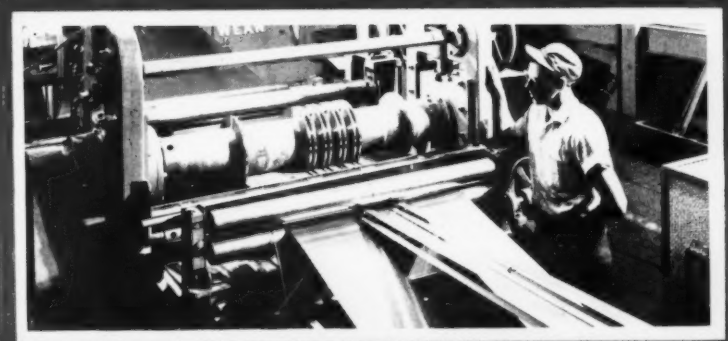
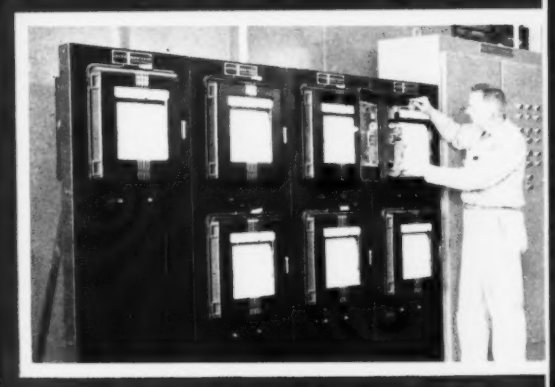
AUGUST • 1958

# Metal Products Manufacturing

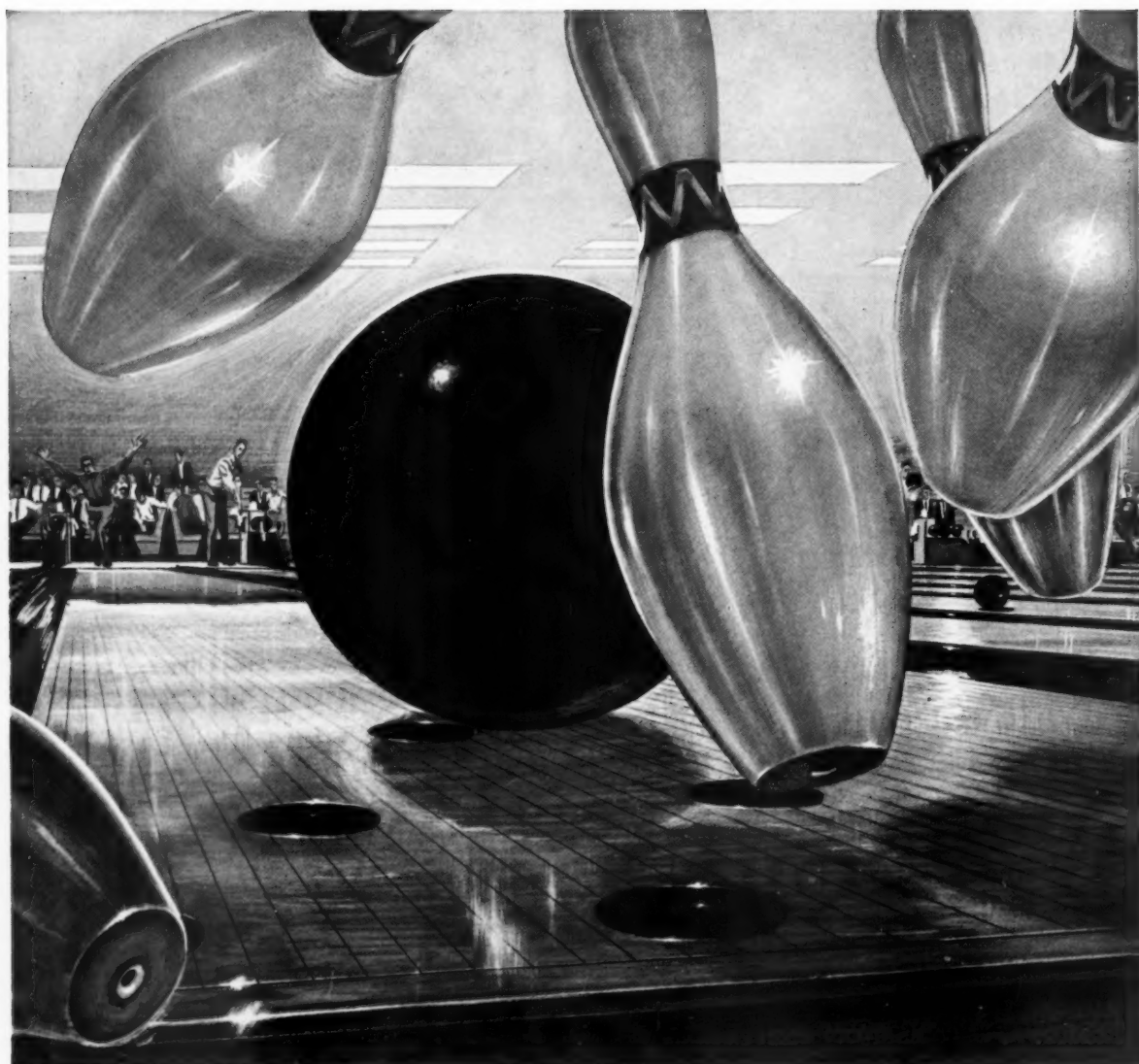
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Working and Operating at Westinghouse—Page 20



## For the finest in finishes—

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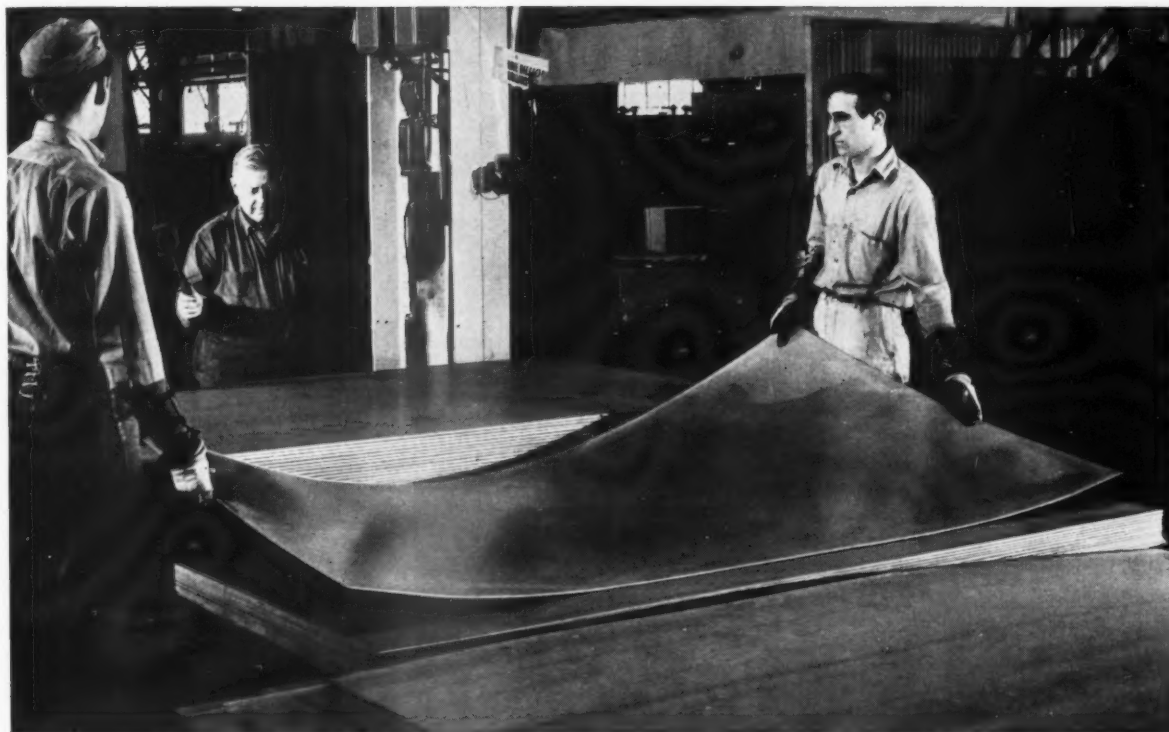
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Epon® Resins  
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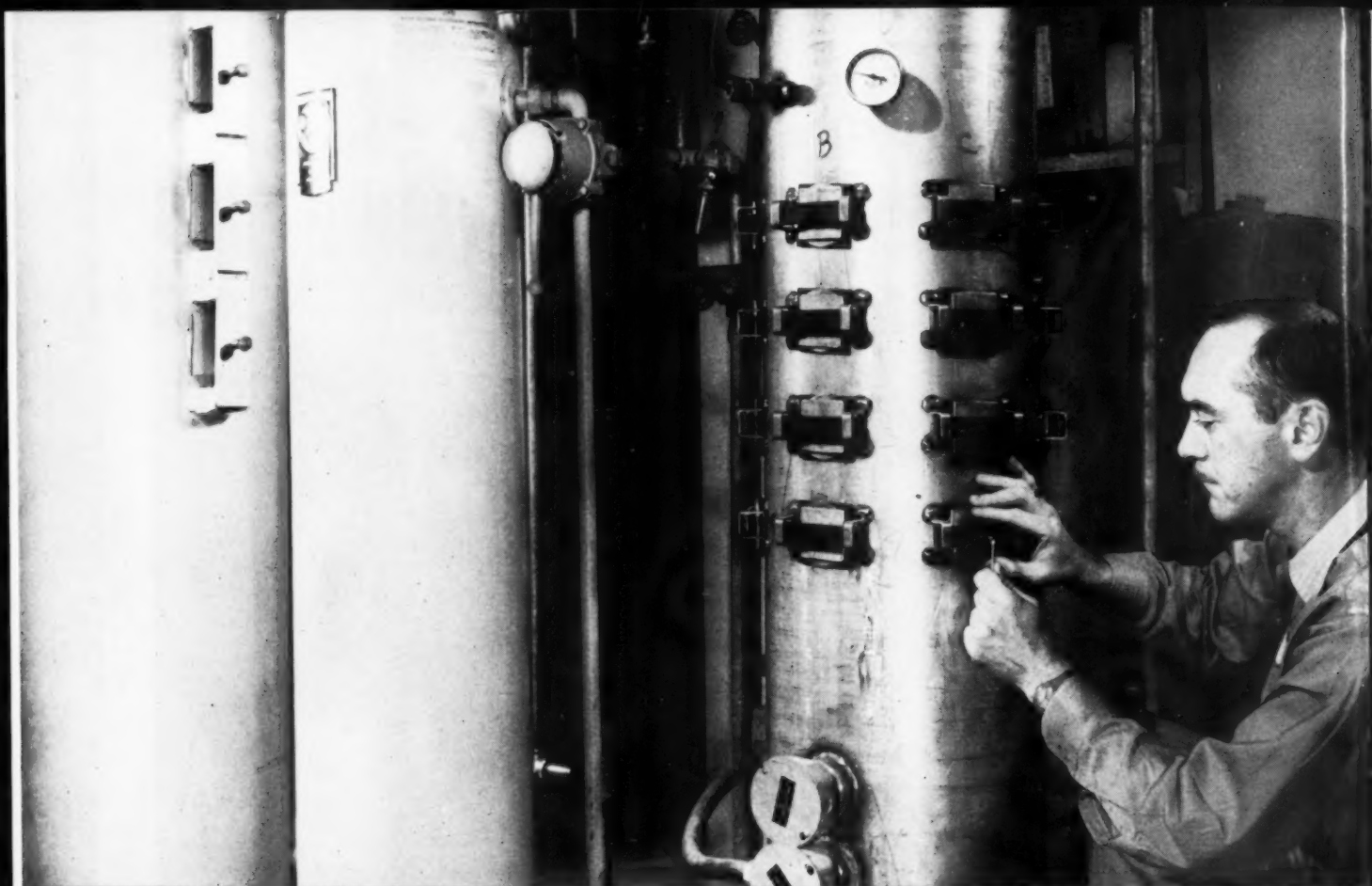
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## ARMCO STEEL



Armco Division • Sheffield Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products

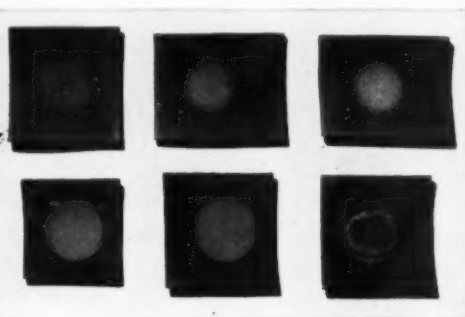




**Accelerated time-tests** under closely controlled conditions reveal relative qualities of glass coatings. "Porcupine" at the right permits testing 24 sample plates at a time. Tank at left is checking samples cut from production water-heater tanks.



**Autoclaves provide** a still faster screening check on new coatings. Sample plates are exposed to abnormally high temperatures and corrosive agents simulating extreme service conditions.



**Typical sample plates** after testing. Here the importance of correct glass selection can be visually noted. Actually, precision tests reveal exact losses in weight of coatings from corrosion attack.



**Trend to higher temperatures** in water heating spurs search for better protective coatings. Accelerated tests run to 300° F., normal service life tests up to 180-190° F.

## PROVING GROUND for water-heater glass coatings



**Still better glass coatings** are on the way — the result of Ferro's continuous research on protective linings for water-heater tanks.

And better protective coatings are *needed*, as water temperatures continue to rise to meet the needs of modern homemaking. Longer guarantees and warranties add further to the problem.

Here at Ferro, all factors of production are

studied as integral parts of a single development project. New frits are tried. New slip formulations developed. New metal cleaning and etching techniques worked out. New firing cycles explored. New equipment introduced and thoroughly tested.

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# MPM

(including finish)

MONTHLY TRADE PUBLICATION

Established January 1944

Published by

DANA CHASE PUBLICATIONS

York Street at Park Avenue, Elmhurst, Illinois  
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AUGUST • 1958

VOL. 15 • NO. 8

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## METAL PRODUCTS MANUFACTURING

FROM RAW METAL TO FINISHED PRODUCT

A trade publication devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. The editorial scope covers design, engineering, market and statistical information and technical and practical information on plant facilities and all phases of manufacturing "from raw metal to finished product." Free controlled circulation to top management, purchasing, engineering and key plant management and supervision in metal product manufacturing plants. To others, subscription price is \$8.00 per year, domestic. To all other countries \$10.00 per year (U.S. funds). Single copies, \$1.00.

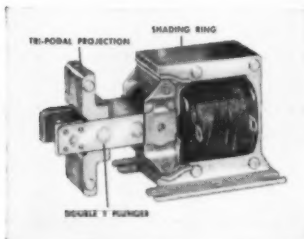
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# Control Engineering Bulletin



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controls for  
creative  
industries

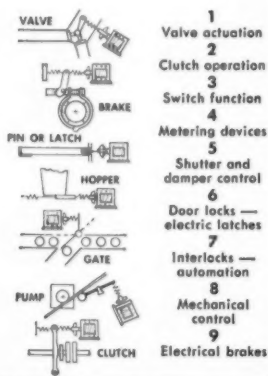


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## from the Editor's Mail

### Report on AIEE conference

Gentlemen: I can't begin to express my gratitude for the excellent report on the AIEE Appliance Technical Conference which appeared in your magazine. I am sure that the publicity value will contribute greatly to the success of next year's conference.

Your generous cooperation was very greatly appreciated.

D. C. Krammes, Chairman  
Subcommittee on Domestic Appliances  
American Institute of Electrical Engineers  
New York, N. Y.

Ed. Note: We at MPM consider this reporting service on important meetings a very important part of our reader service work. We consistently have published staff reports on the industry's important meetings (usually illustrated with exclusive staff photos) since this publication was started in 1944.

### Our apologies to Willie Mae Rogers

Dear Mr. Chase:

... I've just seen the report of . . . (the *Appliance Technical Conference*) . . . in your July issue, and I am somewhat appalled by the fact that your reporter attributed directly to me some quotes I made from consumer letters.

Please note on page 38 the section beginning with the last three lines in the left column.

I certainly do not subscribe to the belief that "modern appliances are a cheap assortment of parts hidden by ridiculously glamorous exteriors." I merely quoted it from a consumer's letter (along with others) to indicate the strong feeling on the subject that prevails among consumers. I've been a part of the appliance industry too long to make such a statement . . .

Is there anything you can do to make me sound less as if I were trying to make all engineers and manufacturers angry with me? . . .

Sincerely,  
Willie Mae Rogers  
Director, The Institute  
Good Housekeeping

Ed. Note: Yes, we certainly can do something by giving Miss Rogers' letter a prominent place in our Editor's Mail columns.

The statement attributed to Miss Rogers, and quoted in her letter, was definitely presented as number (10) in a series of (11) quotes from GOOD HOUSEKEEPING reader mail.

It makes a big difference as to who says what, and Willie Mae Rogers has our humble apology for the misquote.

In deference to our engineer-reporter who covered the presentation, we point to a reason, *not an excuse*, for error. In the manuscript there are a series of (11) quotes, two and one half pages of copy preceded by the statement, "And just to document my story, here are a few quotes gathered from some recent reader mail:"

### Maysteel article of interest

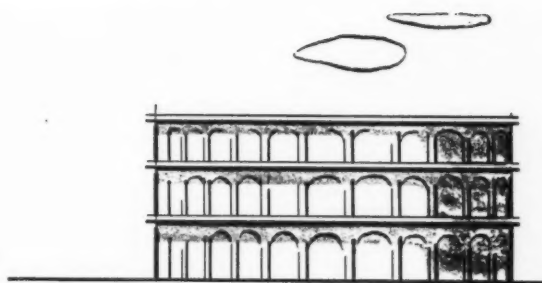
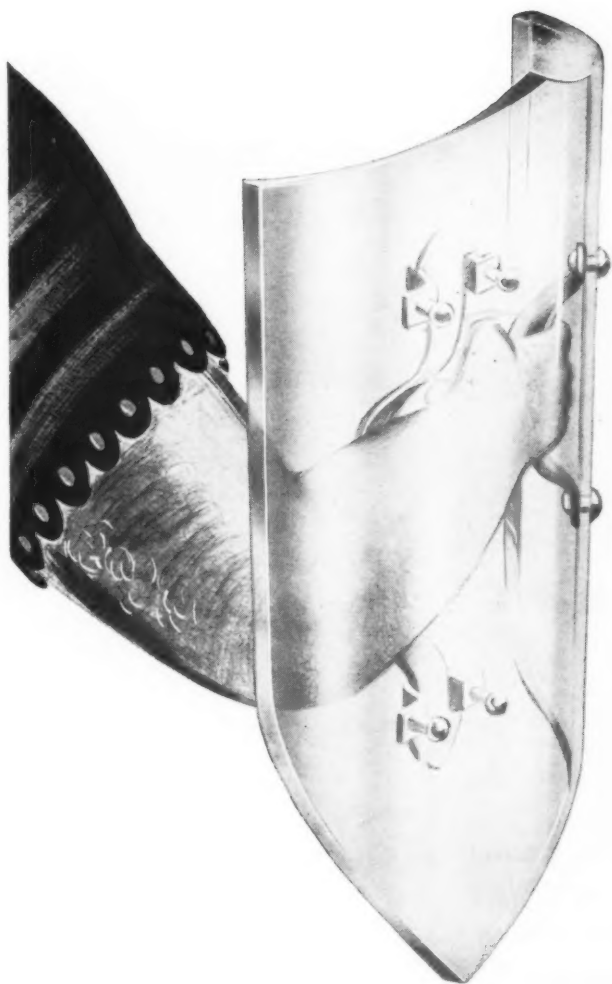
Dear Dana: Congratulations on the excellent story on Maysteel in your July issue. Perhaps in your next issue you might like to refer back to this story and mention that Mr. C. E. Stryker, president of Maysteel, is also national president of PMI. Mr. Charles Weber is the man in charge of the Maysteel plant in Mayville, Wis., and is the one who actually laid out their finishing line.

H. A. Daschner, Managing Director  
Pressed Metal Institute  
Cleveland, Ohio

Ed. Note: Yes, and both Mr. Weber and Mr. Stryker gave our editors their full cooperation in connection with the development of the Maysteel feature in MPM.

→ more Editor's mail on Page 8

AUGUST • 1958 MPM



## this *Glass* shield, *while symbolic,*

represents some of the things a master craftsman can do with glass. It can be bowed to fit any desired shape, it can be drilled and shaped to exact tolerances.

It can be tempered to impart extreme resistance to impact — that is why safety regulations demand glass as a safety barrier when danger exists.

Let glass improve the utility of your product while it beautifies it.



*Let Marsco's craftsmen-engineering team  
impart to your product all the advantages of glass*

**Marsco**

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## INDUSTRY MEETINGS

### ELECTRICAL ENGINEERS

American Institute of Electrical Engineers, (Pacific General Meeting), Sacramento, Calif., August 19-22, 1958.

### MATERIAL HANDLING

Meeting of The Material Handling Institute, Inc., The Greenbrier, White Sulphur Springs, W. Va., September 22-24, 1958.

### IRON AND STEEL

Iron and Steel Exposition, and Annual Convention of the Iron and Steel Engineers Association, Cleveland Public Auditorium, Cleveland, Ohio, September 23-26, 1958.

### PORCELAIN ENAMEL

Porcelain Enamel Institute's Annual Meeting, The Greenbrier, White Sulphur Springs, W. Va., September 25-27, 1958.

### PRESSED METAL

Pressed Metal Institute's Annual Meeting, The Cloisters, Sea Island, Ga., September 28-October 2, 1958.

### TOOL ENGINEERS

American Society of Tool Engineer's Semi-Annual Meeting and Western Tool Show, Shrine Exposition Hall, Los Angeles, Calif., September 29-October 3, 1958.

### PAINT AND VARNISH

The thirty-sixth Annual Meeting of the Federation of Paint and Varnish Production Clubs, and the twenty-third Paint Industries Show, Cleveland Public Auditorium, Cleveland, Ohio, October 5-8, 1958.

### PACKAGING, HANDLING, SHIPPING

Thirteenth Annual Packaging, Handling, and Shipping Show, (Society of Industrial Packaging and Materials Handling Engineers) Coliseum, Chicago, Ill., October 14-16, 1958.

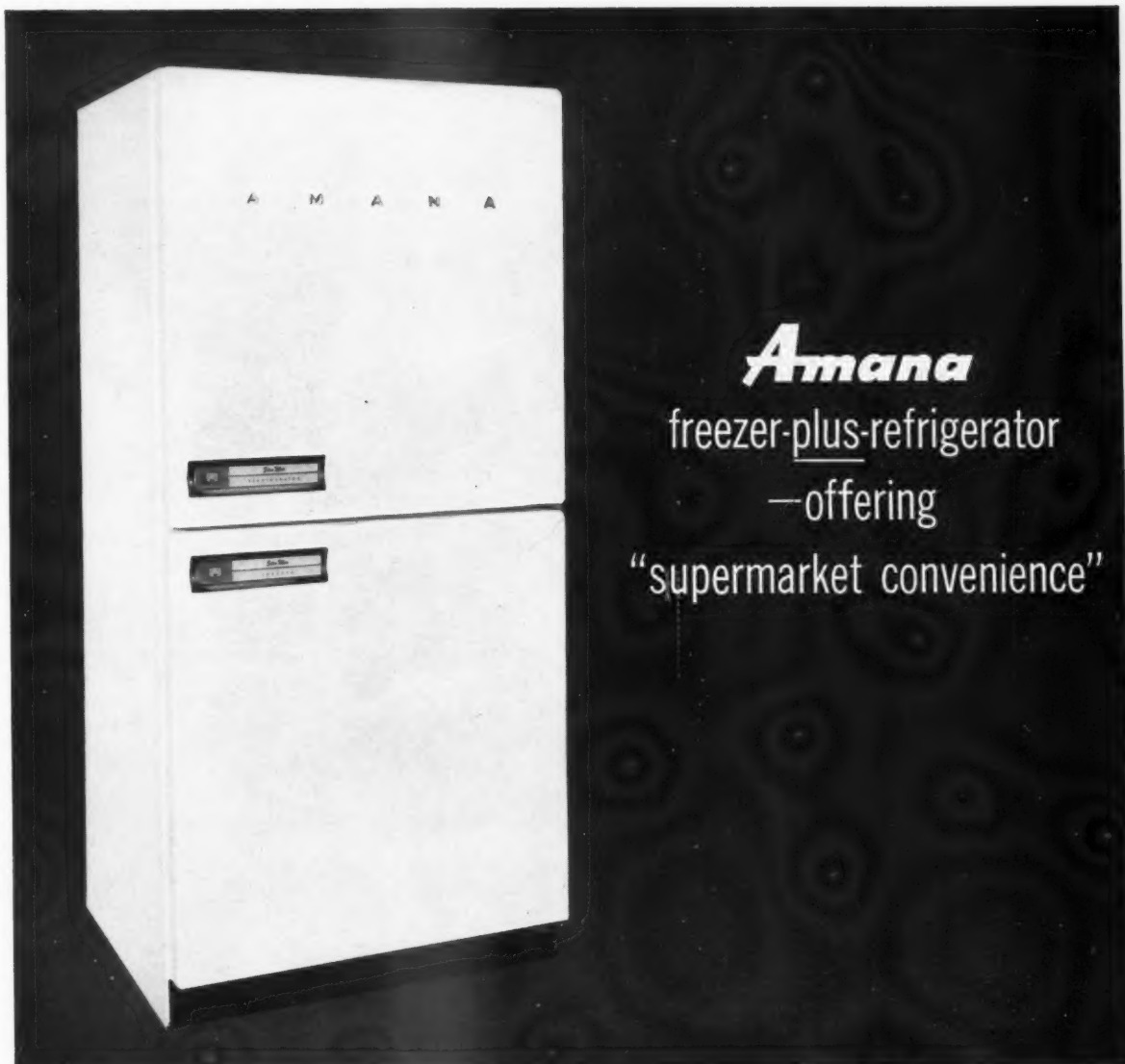
### METAL EXPOSITION

The 40th National Metal Exposition and Congress, Cleveland Public Auditorium, Cleveland, Ohio, October 27-31, 1958.

### HOME LAUNDRY

Twelfth National Home Laundry Conference, The Chase Hotel, St. Louis, Mo., October 30-31, 1958.

AUGUST • 1958 MPM



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freezer-plus-refrigerator  
—offering  
“supermarket convenience”

When quality of finish must be the finest—  
today's leaders in refrigeration choose

**Du Pont DULUX® Enamel**



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**“DULUX” ENAMEL**

MPM AUGUST • 1958

Appliances that can promise outstanding mechanical performance necessarily require a *finish* just as carefully engineered. DULUX is such an enamel, developed and perfected by Du Pont chemists specifically for use in major appliances. This finish will keep its good looks long after the sale. It resists staining and is easy to clean.

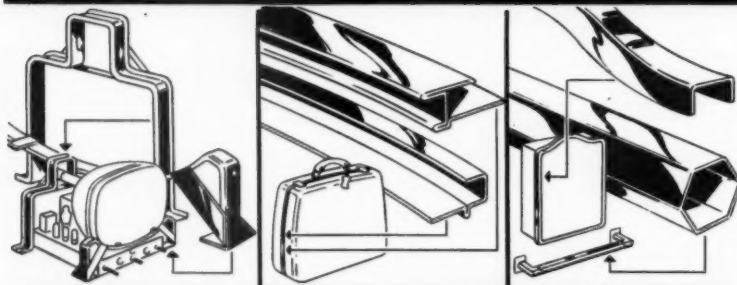
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Trouble-free performance on the production line . . . carefree performance in the home: that's the prospect when you use DULUX on your line. Whatever your method of application, there's a DULUX appliance finish that's right for your next job. Talk it over with your Du Pont Finishes Representative. He can help. E. I. du Pont de Nemours & Co. (Inc.), Finishes Division, Wilmington, Del.

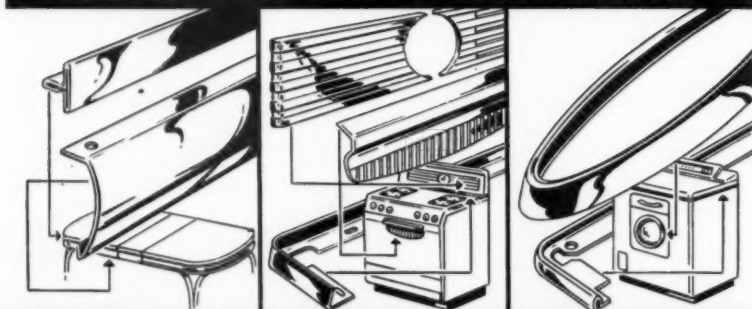
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Over 65,000,000 major home-appliance units have been  
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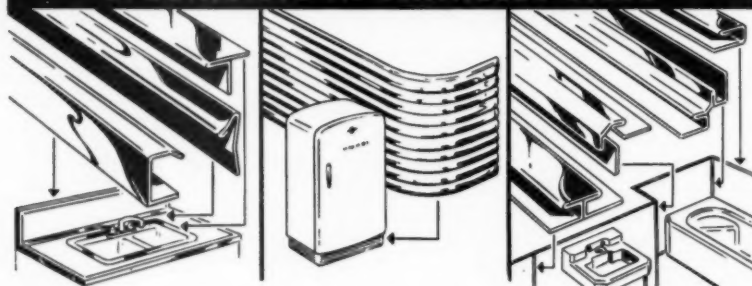
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## Editor's Mail

→ from Page 4

### Road to oblivion

Gentlemen: We are very grateful for the excellent coverage you gave the Institute's annual convention held in Cincinnati last month. There are two points about the article on which I think you might like to have further information.

You will remember quoting Mr. Gilman as saying that "if the appliance industry remains in 1970 as it was in 1957, it is well on the road to oblivion." I should like to have you bear in mind the comment which I made at the conclusion of Mr. Gilman's speech which I think has a considerable measure of truth in it:

*"Although I agree with many of the things Mr. Gilman has said to you, I do not go as far as he does. The appliance industry will never go into oblivion, but it may change so drastically in the next ten years that, if you manufacturers don't change with it, your individual companies may not be in the appliance business ten years from now."*

The second comment is that the Institute did not decide to have a single meeting every year in the future, but merely to postpone the December meeting in 1958. Unless further action is taken by our board of trustees, we will resume the two-meetings schedule in 1959.

Pauline Duncel, Executive Secretary  
Institute of Appliance Manufacturers  
Washington, D. C.

Ed. Note: MPM editors thank Mrs. Duncel for the kind words, and particularly for the comment on the Gilman report and clarification of the future meeting plans.

### Voice from Vienna

Gentlemen: Let me thank you very much indeed for letting me have the April edition of your journal with the picture of the Austrian management productivity study group on page 50 which, I assure you, is a nice souvenir of my journey to the United States.

W. Oburger  
Osterreichisches Produktivitäts-Zentrum  
Vienna, Austria

### Won't miss an issue

Gentlemen: Will you please change my mailing address from Servel, Inc., to Whirlpool Corp., Plant No. 7. I have accepted a position with Whirlpool, and certainly do not want to miss a single issue of your very fine magazine.

H. P. Juncker  
1416 N. Weinbach Ave.  
Evansville, Ind.

### Curtain wall statistics of interest

Gentlemen: In your June, 1958 issue, Page 83 of METAL PRODUCTS MANUFACTURING, you mentioned in the next to

to Page 16 →





Gracing today's finest tables

stainless

hollow ware



fabricated of

**Superior**

STAINLESS STRIP STEELS



● MARK II design  
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Meriden, Connecticut

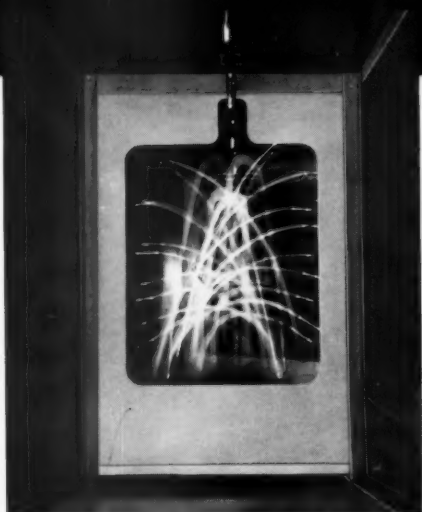
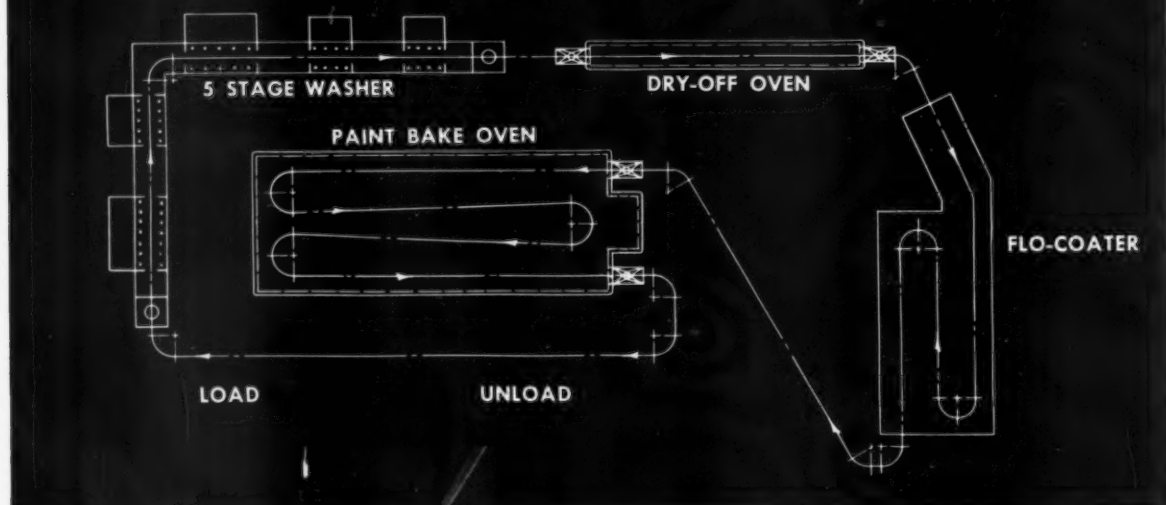
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*Stainless—without care!* Modern hollow ware of Superior Stainless Steel has the sheen of precious metal without penalty of upkeep . . . strength to resist dents and scratches in service . . . and "willingness" in fabrication that permits free range in design and manufacturing methods. For full details on Superior Stainless grades, sizes and tempers fitting your applications, address our Sales Department.

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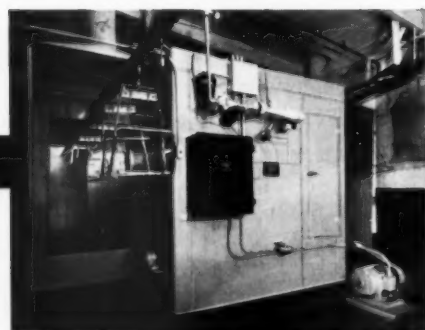
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Air-jet "curtains" at entrance and exit of MOCO baking oven act as a barrier against heat loss. The system is fully equipped with electronic flame failure safeguards.



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**ALL-ELECTRIC  
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TEMPERATURE  
CONTROL**

## FOR THE USER

Provides dependable automatic control of cooking temperatures. Any selected increment of temperature from 100° F to 485° F is reached quickly and then uniformly maintained. In boiling, for instance, pan temperature is accurately controlled at any desired point from a slow simmer to a vigorous boil.

These control elements are not fragile —not damaged or thrown out of adjustment in normal service.

There is no danger of electric shock because only low voltage is used in the control circuit. (12 V)

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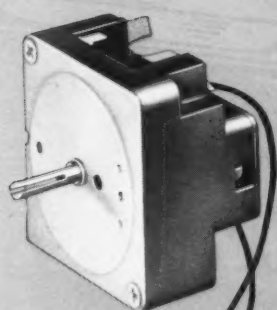
Chef-O-Matic is low in cost. It is easy to install because the two small, compact control elements are ALL-ELECTRIC. They readily fit any electric range. Spade terminals simplify connections.

A single temperature adjusting screw compensates for changes in altitude and for differences in range design.

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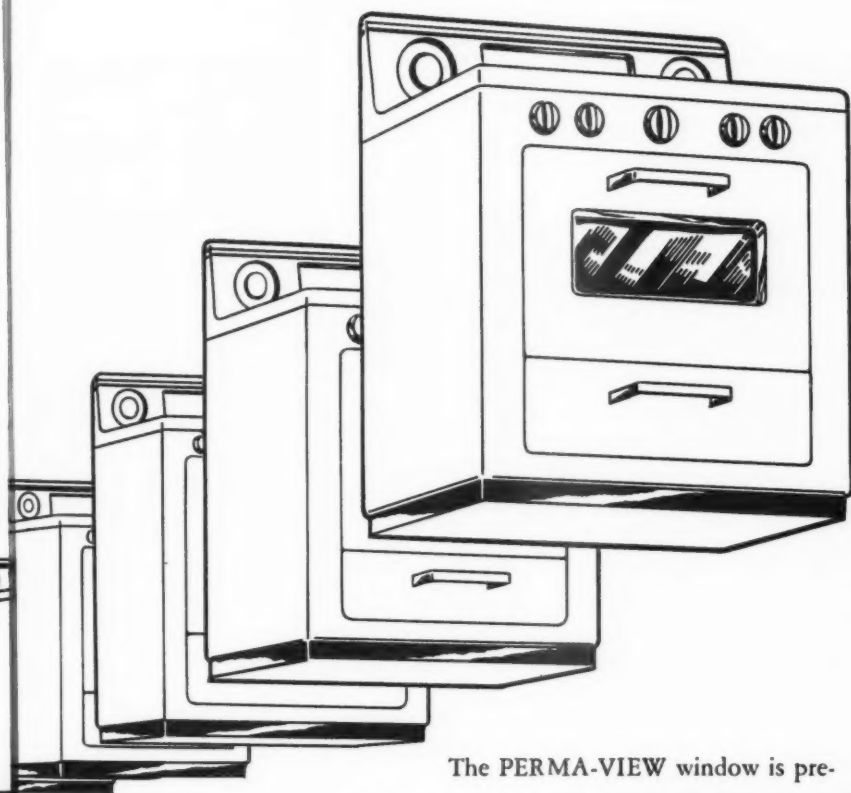
**Gurney  
PRODUCTS**

**PERMA-VIEW  
RECEIVES**

**WORLD-WIDE  
ACCEPTANCE!**

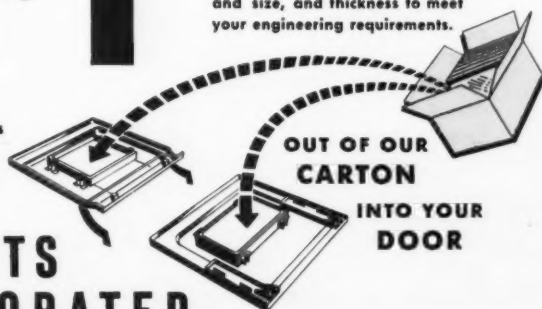
PERMA-VIEW oven door windows are fast becoming standard with leading range manufacturers in the United States, from Coast to Coast. Now, leading manufacturers in other countries are learning the sales advantages of the PERMA-VIEW "No-Fog" window too.

(Accompanying names and trademarks represent some of the present users outside the United States.)



The PERMA-VIEW window is pre-engineered, and comes to you ready for immediate installation in your range. "Out of our carton into your door." With PERMA-VIEW you get "a window you can see through always." Let our specialized production lines serve as a part of your sub-assembly facilities. Phone or write us for complete details on the ease and economy of adding this sales feature to your new ranges.

Alternate methods  
of attachment  
may be used



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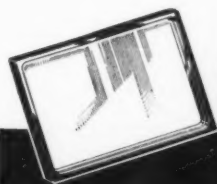


SQUARE



TRAPEZOID

We can manufacture any shape, and size, and thickness to meet your engineering requirements.



**MILLS PRODUCTS INCORPORATED**

1015 WEST MAPLE ROAD

WALLED LAKE, MICHIGAN



# THE finish LINE

**THERE ARE BRIGHT SPOTS . . . . .** in the metal products field which point to the fact that the individual manufacturer with the right product, a sound distribution setup, and a sales and service policy tuned to present day marketing problems, *can* move merchandise in sufficient quantities to ensure profitable plant operations and a reasonable profit picture.

## Air conditioners and freezers

Production workers at Amana Refrigeration, Inc. began a nine hour daily work schedule in mid-June and a half-day work schedule on Saturdays, in order to meet the demand for Amana air conditioners, freezers, and refrigerators, George C. Foerstner, executive vice president reported. The production increase was necessitated by a 48 per cent increase for air conditioning units over 1957 and a ten per cent increase in freezers over last year's sales.

According to Foerstner, this increased demand comes from both distributor and consumer levels. "Our inventories at the distributor level are extremely low, which indicates that the consumer is beginning to purchase white goods items again, and that the downward trend for white goods and the appliance industry has reached bottom, and is on the way up."

Foerstner expressed the belief that the fourth quarter of this year will show a pronounced pickup for many companies. However, he said, the pickup will apply only for the better run concerns that are working harder and aggressively going after business — and — those companies that are not carrying a lot of dead wood in their sales. He looks for a wide gap between the aggressive companies and those which are using the sales techniques and philosophies of three and four years ago.

"There is ample employment," he said, "for those who are willing to take responsibility and produce to the capacity which is required for a company to operate at a profit."

## Home laundry equipment

Domestic and export home laundry appliance factory sales during May were up 14 per cent from April and, for the first month since November, 1956, exceeded the previous year's May total by 3 per cent, according to AHLMA.

Within this segment of the appliance field, Maytag reported an increase of 6.6 per cent in net income for the first quarter of 1958 (*June MPM — page 57*). Over \$17 million worth of appliances were sold during a three day sales campaign by the same company, and 275 additional employees were added (*July MPM — page 63*).

Harry Kane, general manager of Whirlpool Corp.'s\* laundry division, reported that, as early as June, RCA-Whirlpool washer-dryer sales to dealers were over 28 per cent ahead of the 1957 figures. (*July MPM — page 78*).

\*(See Press Time News, Page 62, this issue.)

## Central air conditioning

At press time for this issue, John W. Norris, president of Lennox Industries Inc. of Marshalltown, Iowa, reported that during the first six months of this year, sales of its central residential and commercial air conditioning equipment showed an increase of 5 per cent over the same period in 1957.

Norris attributed the increase to the company's introduction early this year of its Landmark line of central residential year round air conditioning equipment. He said the new equipment was specifically designed for use in both new and existing homes. He estimated that there is a potential market of nearly 20 million existing homes for installation of year round air conditioning.

It is not our intent to list the companies in the appliance and metal products field whose sales and/or profits are heading in the right direction. It *is* the intent to stress the fact that there *are* bright spots in the field and that it *is* possible for individual companies to forge ahead under proper conditions, some of which are mentioned by Mr. Foerstner.

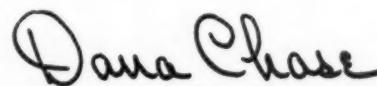
## 18 million home appliances annually

Judson S. Sayre, president of Norge, said recently, "By 1963, we will enter a new era of growth and can easily sell some 18 million home appliances annually, more than 4 million in excess of what will be marketed this year." At the same time, he reported that Norge factory sales for May were 8 per cent ahead of May, 1957 — the first month of this year to top the comparison month for last year.

Norge announced three new appliances for retailing to start in July: a new refrigerator with an automatic ice cube maker (*July MPM — page 20*), a popular priced electric range that "broils sideways," and a new combination washer-dryer.

Regardless of the credence accorded published surveys and market potential estimated by experienced men in the industry, it becomes increasingly evident that the individual company that is waiting for the "boom years" to come may well be among the missing when the "early sixties" roll around.

We may expect to see an increasing number of BRIGHT SPOTS in the metal products field and a dimming to oblivion for those companies whose managements have failed to see the need for newly designed, *well-built* products, and the necessity for an up-to-date distribution, sales and service program.

  
EDITOR AND PUBLISHER

AUGUST • 1958 MPM





# Inseparable-

- sanitation and a sanitary appearance
- easy-to-clean porcelain enamel
- Pemco Frits and Colors

An easy-to-clean porcelain enamel surface is the best way to wipe out sanitation problems in food display and handling equipment.

The best way to get versatility in porcelain enamel application . . . uniform results . . . and color matching characteristics that reduce production costs—specify Pemco Frits and Colors.

At Pemco, controlled formulation and smelting plus objective testing assure you of consistent uniformity of basic material.

Get the full story on Pemco frits, colors and personalized assistance from your Pemco sales engineer.



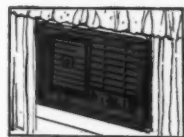
**PEMCO CORPORATION**

BALTIMORE 24, MARYLAND

Manufacturers of "the World's Finest" Porcelain Enamel Frits, Glaze Frits, Coloring Oxides, Screening Pastes, Body and Glaze Stains, Underglaze and Overglaze Colors, Vitrifiable Glass Colors.



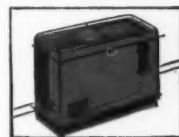
Business Machines...



Air Conditioners...



Kitchen Cabinets...



Home Freezers...look best, wear best, SELL BEST with a Porcelain enamel finish.

## METAL PRODUCTS STATISTICS

a current report on available production, shipment and sales figures for important products in the appliance and fabricated metal products manufacturing field

	1958 (Units)	1957 (Units)	% Change
Gas Water Heaters.....May	209,100	233,400	-10.4
Jan.-May	1,105,100	1,121,300	- 1.4
Gas Ranges, Built-In.....May	20,300	15,900	+27.7
Jan.-May	77,500	73,100	+ 6.0
Gas Ranges, Free-Standing....May	127,200	140,300	- 9.3
Jan.-May	630,600	742,500	-15.1
Gas Furnaces.....May	55,700	49,900	+11.6
Jan.-May	248,200	239,500	+ 3.6
Gas Fired Boilers.....May	8,000	7,000	+14.3
Jan.-May	31,400	30,800	+ 1.9
Gas Conversion Burners.....May	10,400	8,100	+28.4
Jan.-May	39,200	40,000	- 2.0
Electric Refrigerators.....Apr.	210,800	281,600	-25.1
May	262,900	303,700	-13.5
Jan.-May	1,168,700	1,498,700	-22.0
Electric Freezers.....Apr.	79,300	70,900	+11.8
May	87,900	82,300	+ 6.8
Jan.-May	372,100	376,400	- 1.4
Electric Ranges, Free Standing..Apr.	58,300	72,000	-19.3
May	53,000	63,200	-16.3
Jan.-May	336,200	434,600	-22.7
Electric Ranges, Built-In.....Apr.	37,300	35,200	+ 6.0
May	43,000	30,400	+ 6.1
Jan.-May	148,000	147,400	+ 0.4
Electric Storage Water Heaters..Apr.	68,500	65,600	+ 4.4
May	66,100	71,500	- 7.6
Jan.-May	322,900	322,200	+ 0.2
Electric Dishwashers.....Apr.	26,700	26,000	+ 2.7
May	30,600	24,800	+23.4
Jan.-May	149,800	157,800	- 5.1
Electric Food Waste Disposers..Apr.	40,000	38,400	+ 4.2
May	46,400	35,900	+29.3
Jan.-May	221,400	211,500	+ 4.7
Combination Washer-Dryer....May	7,780	9,512	-18.0
Jan.-May	57,782	82,951	-30.0
Washers, Automatic & Semi...May	191,779	190,738	+ 1.0
Jan.-May	970,328	1,102,042	-12.0
Washers, Wringers & Others...May	71,220	71,692	- 1.0
Jan.-May	318,434	366,464	-13.0
Electric Dryers.....May	28,515	21,474	+33.0
Jan.-May	236,863	295,301	-20.0
Gas Dryers.....May	13,383	11,372	+17.0
Jan.-May	95,509	128,949	-26.0
Vacuum Cleaners.....May	218,766	231,246	- 5.4
Metal Furniture.....May	N. A.	N. A.	- 1.0
Jan.-May	N. A.	N. A.	- 6.0
Television.....Apr.	213,520	329,710	- 4.6
Jan.-Apr.	1,570,279	1,787,346	-12.1
Radio.....Jan.-Apr.	1,751,347	2,167,016	-19.1
Compressor Bodies.....Feb.	328,760	N. A.	-25.0
Jan.-Feb.	856,504	N. A.	-15.0
Steel Barrels & Drums.....Apr.	2,587,192	3,118,467	-17.0
Jan.-Apr.	10,030,376	12,297,108	-18.0
Steel Pails.....Apr.	6,120,000	6,553,000	-13.0
Jan.-Apr.	21,575,651	24,241,238	-11.0
Typewriters.....May	84,127	410,825	N. A.

Sources for this information: Gas Appliance Manufacturers Association, National Electrical Manufacturers Association, American Home Laundry Manufacturers Association, Vacuum Cleaner Manufacturers Association, National Association of Furniture Manufacturers, Electronic Industries Association, and Air-Conditioning and Refrigeration Institute, U.S. Dept. of Commerce.

## Editor's mail

→ from Page 8

the last paragraph of this issue that during 1957 there were 791 porcelain enameled curtain wall buildings constructed in the United States.

We would be most interested in learning if these were steel or aluminum curtain wall jobs. It is also stated that this listing was compiled by the Porcelain Enamel Institute. Could you advise us how to obtain a copy of this listing. Your cooperation in this matter is deeply appreciated.

R. E. Pettit, Technical Advisor  
Metal Industries Department  
The Diversey Corp., Chicago

Ed. Note: We are informing the Porcelain Enamel Institute of Mr. Pettit's interest in curtain wall construction, and are confident that they can fill in the missing data on aluminum versus steel.

## Looking forward to the 1959 Appliance Technical Conference

Dear Dana:

In reference to your letter of June 11 on the discussions held between the Domestic Appliance Subcommittee and the Subcommittee on Fractional Horsepower and Single Phase Motors. There was considerable interest in better definition of the environmental factors synthetically created in appliances which would bear upon the design of electrical components and in particular, the motors. Engineers engaged in motor design and engineers engaged in appliance design will be encouraged by both Subcommittees to work together on specific problems, for example, effect of water and detergent chemistry on motor insulation, effect of motor switching characteristics on ability to handle high torque, high acceleration loads; matching motor design curves and appliance mechanical load curves to produce a more simplified approach to special design of motors for a particular appliance and the like. Several projects of this nature have been reported as being under way with good possibility of producing papers for discussion at the 1959 Conference. A similar situation exists with regard to appliance lighting techniques, and it has been reported that there is some work under way which may be available at the May 1959 Conference. At this writing, the projects mentioned appear to be a preview of what might be in store at our 1959 Conference.

Marvin A. Fuller  
Whirlpool Corp.  
St. Joseph, Mich.

Ed Note: Marvin Fuller has been very active in AIEE work and will be chairman, Subcommittee on Domestic Appliances, American Institute of Electrical Engineers, sponsoring group for the Domestic Appliance Technical Conference. The 1959 conference will be held at the Hotel Manger, Cleveland, Ohio, May 18-19, 1959. E. G. Merrick, General Electric Co., is the local chairman of the conference.

# Now — The **MINI-BREAKER**<sup>®</sup> line has been extended to include any type circuit or motor protection you want



In recognition of your request, our engineers, through thousands of exhaustive tests they conducted, which duplicated the actual uses of each appliance, have extended our Mini-Breaker motor protector line to include devices that re-set manually or re-cycle automatically, that mount remotely or attach to the motor and are activated by both current and motor temperature. Whether you are interested in cost reduction, elimination of field

service, improved quality, dependability, or design, our new miniature Mini-Breaker motor and circuit protectors will meet your requirements. Invite us in. We want to discuss every model in detail and also show you case histories of how Mini-Breaker has proven to be a sales feature.

**MECHANICAL PRODUCTS, INC.**  
Jackson, Michigan



Branch circuit protector

Motor protector

Electric range outlet protector

Remote mount motor protector

Remote mount motor protector

Frame-mount motor protector

Grounded adapter with protector

Range outlet with protector

Cord end protector

*Mini-Breaker Can Make the Difference That Makes the Sale*

# THE MPM *spotlight*



New Kelvinator "Thin-Style" 1958 room air conditioners combine compact, modern styling with two-directional cooling that can air condition two rooms with one unit. With minimum inside and outside overhang, they may be installed in narrow, 27-inch windows. Only 1¾ inches extend from the window sill, permitting drapes to be drawn when unit is not in use. Five of the units operate on standard household circuit of 115 volts, drawing either 12 or 7½ amps.





## Dow Latex in paint primer guards T-Bird quality!

Rust won't take its toll in Thunderbird quality! The under-structure of these sleek new models is thoroughly protected with a rust-preventive dip-coating of paint primer formulated with Dow Latex.



You get a lot more than quality insurance with these revolutionary new paints for metal. They dry to a tough, durable coating salt spray can't penetrate. They eliminate fire hazard and

costly solvent recovery systems because water replaces flammable solvents. Latex paints for metal mean safer working conditions and can mean lower insurance rates for your plant. And they can be used without changing your present systems.

Ask your supplier now about paints for metal formulated with Dow Latex. Or get details from THE DOW CHEMICAL COMPANY, Midland, Michigan, Coatings Sales Dept. 2150R-1.

YOU CAN DEPEND ON





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◆ Overall view of slitting and shearing lines at Westinghouse Electric's Columbus, Ohio appliance plant. Lines are arranged in a "U" shape, material flow being from slitting line uncoiler through slitting line, then to shearing line uncoiler through to layout table.

PHOTOS COURTESY WEAN EQUIPMENT CORP.

Shear line showing, left to right, uncoiling stand and rolls which remove coil "set," roller-leveler, shear, and runout table.



## Slitting and shearing at the Westinghouse Columbus plant

WHEN THE COLUMBUS, OHIO plant of Westinghouse Electric Corp. was completed in 1954, MPM editors covered the plant completely, and the result was a series of articles covering the major operations from fabrication to shipping.

Since this earlier series, a number of changes and additions have been made in plant equipment and processing techniques. One of the major additions is a complete, integrated slitting and shearing line which provides for the procurement of coil stock to be used in the production of refrigerators and other major appliances produced in this plant.

The line has now been in operation at Columbus for ten months, so that engineers and production men could give us some information on the results in addition to the basic specifications for the equipment.

### Pull-through slitting line

Coil stock is purchased in standard 48-inch widths, then slit to size as desired. Two speeds are utilized for slitting—97 to 250 feet per minute, and

220 to 570 feet per minute. Five or six cuts can be made at one time, varying in width from three inches to 21 inches. The slitting line automatically re-coils the slit stock with a slight separation, so that the slit coils can be handled separately.

The pull-through slitting line at Westinghouse consists of coil ramp, tilting floor-type loading buggy, aligning uncoiler with feed-up, hydraulic pumping unit, slitter, scrap baller, recoiler, over-arm separator device, and tilting floor-type unloading buggy.

The slitting line is serviced by overhead traveling crane which brings the coils of steel from storage and places them on the coil ramp, which also has a capacity of storing four coils. From here, the coils are processed on to the loading coil buggy, to the uncoiler, to the slitter, to the recoiler, and on to the unloading buggy, after banding the individual coils of the new widths while still on the recoiler. During the slitting operation (if needed), a trim is taken off each outer edge and this trim is gathered up by the scrap baller. This

### Data on material and slitting line

Material:—mild steel.  
Strip width:—48" maximum.  
Strip gauge:—.025" to .125".  
Coil weight:—20,000 lb. maximum.  
Coil size:—20" and 24" ID at entry end.  
20" ID at exit end.  
52" OD maximum, both ends.

### Line speed

Low speed range:—97 fpm on 20" dia. recoiler head with speed increasing to 250 fpm due to coil build-up to 52" dia.  
High speed range:—220 fpm on 20" dia. recoiler head with speed increasing to 570 fpm due to coil build-up to 52" dia.

### Capacity

Low speed range:—7 cuts in .125" thick mild steel to 20 cuts in .025" thick mild steel.  
High speed range:—2 cuts in .125" thick mild steel to 20 cuts in .025" thick mild steel.

### Shearing line

Uncoiler:—not driven.  
Pinch roll:—driven by 5 hp, 1,150/2,300 rpm gear motor.  
Shear:—driven by 50 hp, 1,750/1,925 rpm motor.  
Run-out conveyor:—driven by 5 hp, 1,150/2,300 rpm gear motor.  
Leveler:—driven by 25 hp, 1,150/1,725 rpm motor.  
Inspection conveyor:—driven by 5 hp, 1,150/2,300 rpm gear motor.



trim varies from a maximum of  $\frac{1}{4}$ -inch width down to zero.

Fifty per cent of the coils from this slitting line are transported and placed in coil cradles and fed through roll straighteners directly into punch presses.

The remainder is put on a coil ramp for entering the shearing line. The widths of these coils vary from six inches to 48 inches, and are cut into lengths varying from 12 inches to 16 feet.

#### 48-inch shearing line

The motors and their controls, as listed under "Data," operate on 230 volt dc power. This source of power is produced by a motor-generator set, driven by a 125-hp, 80-per cent leading power factor synchronous motor, 4,160 volt, 3 phase, 60 cycle, driving a dc 230-volt generator at 1,200 rpm. Speed control of the entire shear line over its entire speed range (50 to 200 fpm), is accom-

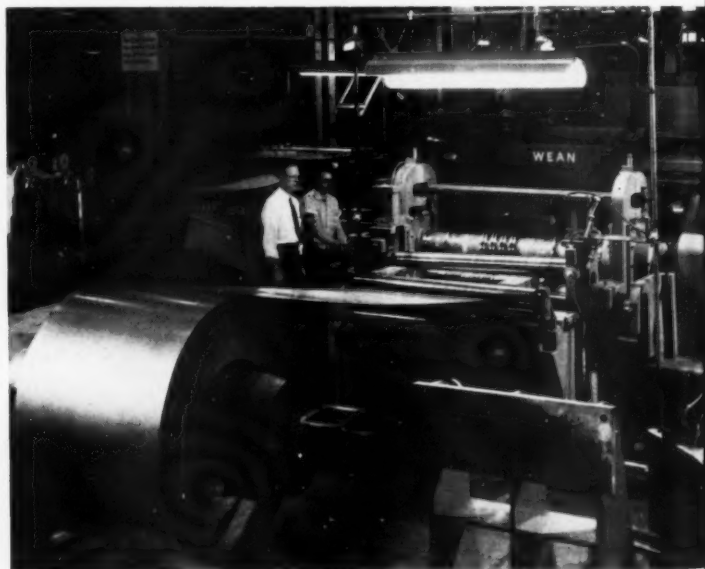
plished by rheostat adjustment at the operator's control desk.

Westinghouse runs approximately 80 tons of steel through the shear line per eight-hour shift. The production high to date has been 27 tons per hour, or 350 tons in three days, working two shifts, including 15 shear changes. Maximum speed for the line is 200 feet per minute with a minimum practical speed of 75 feet per minute. Coil widths of from eight inches to 40 inches (from the slitting line) are normal, but slit coil of three-inch width has been handled. Most of the stock varies from .032—.046 cold rolled steel. Sheets are sheared to sizes required to make refrigerator wrapper sheets, doors, rear panels, bottom pans, mullions, and food compartment tops and bottoms, etc. These sheets, after the shearing operations, according to their sizes, are either palletized or bundled and transported to point of use. Transportation is either

by overhead traveling crane or fork lift truck.

Some of the practical results listed by Westinghouse engineers and plant men, following the production use of the slitting and shearing equipment, include the following: (1) less steel inventory is required, (2) simplification of material handling is effected, (3) standard 48-inch coils are purchased with resulting economy, (4) requirements are handled by three to four coil sizes instead of 75 sizes of sheets, (5) savings realized in both manpower and floor space, (6) coil stock can now be supplied immediately to press lines, and (7) increased flexibility. Stock can be slit and sheared to keep production lines running without delay when requirements are altered. If necessary, stock can be slit for emergency requirements when production schedules must be changed quickly, without consideration for delivery.

*Lower left—Over-arm separator and recoiling mandrel on the slitting line. Slit coil is given slight separation on mandrel by separator for easier handling. Lower right—Slitting line from uncoiler end. Bottom—Slitting line. Right to left, elements are: uncoiling mandrel, roller-leveler, slitting stand, and recoiling stand.*







## Dirty Jobs Call for Good Cleaners

Maybe your cleaning job doesn't present the same problem facing this young man's mother — but if it's a metal cleaning job — L. R. Kerns Company can solve your problem. Check coupon for free Technical Data Sheets on the following cleaners and phosphatizing compounds.

### MOR-KLEEN CLEANERS

**K-11** An alkaline, low foaming type cleaner developed for economical power washer applications.

**AL-2** Buffered alkali especially compounded to eliminate etching or corrosion in cleaning aluminum.

**K-1** Alkali — A general purpose cleaner compounded for still tank applications.

**K-4477** Primarily developed as a highly efficient cleaner for use in vitreous enameling cycles.

**SK-1** Solvent emulsion — for removal of oils, greases, drawing compounds and similar contaminants in a power washer unit.

### — L. R. KERNS COMPANY —

Subsidiary Plant Kerns Pacific Corporation

2659 E. 95th  
Chicago, Ill.

630 N. Batavia  
Orange, Calif.

Offices in Principal Cities throughout the U.S.A.

### PHOSPHATIZING COMPOUNDS

**Phos-Film 4222** — A general purpose compound that provides a paint bond with exceptional adhesion.

**Phos-Film 4353** — A special compound that cleans and phosphatizes in one operation.

### L. R. KERNS COMPANY

2659 E. 95th Street, Chicago 17, Illinois

Please send technical data sheets:

Name _____	Mor Kleen	<input type="checkbox"/>
Title _____	K-11	<input type="checkbox"/>
Company _____	AL-2	<input type="checkbox"/>
Street _____	K-1	<input type="checkbox"/>
City _____	K-4477	<input type="checkbox"/>
Zone _____	SK-1	<input type="checkbox"/>
State _____	Phos-Film 4222	<input type="checkbox"/>
	Phos-Film 4353	<input type="checkbox"/>

# MPM Suggestion Box

## Low cost magnetic metal inspection

**F**ERROFLUX, a low-cost, portable magnetic inspection device which is said to effectively detect surface and sub-surface defects in ferro-magnetic material, has been announced by Ferro Machine & Tool Corp., Indianapolis.

The light weight and portability of the unit makes it possible to "take the inspection device to the parts instead of taking the parts to the inspection device." It also offers new latitudes in quality control through an inexpensive and highly-accurate method of discovering both surface and sub-surface defects in magnetic metal parts. This method is proving especially adaptable and valuable in industries concerned with the engineering and manufacturing of items directly or indirectly related to the welding, heat treating, missile, automotive, and steel erection industries, etc., and to all types of metal fabrication where quality is a prime requirement, and quality control a constant problem.

The device weighs only 23 pounds, and consists essentially of a U-shaped



*Ferroflux unit is said to be light in weight (23 pounds), and can be readily taken to any station where inspection of parts is necessary.*

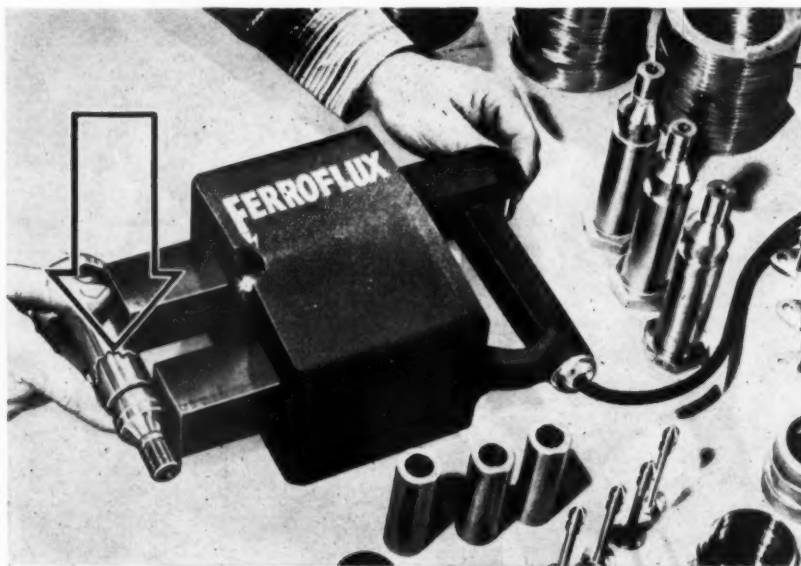
110 volt electromagnet which operates at .175 KVA on 110 volts. Its light weight, compact design, and convenient handhold make it easy for it to be used in many places difficult to reach with heavier and more expensive equipment. Also, because it is light and portable, the unit can be used at various stages in any fabrication operation, including machining stations prior to expensive machine operations where it would be difficult or impractical to move such parts or assemblies to the inspection department for checking. The magnetic field which is set up by the device is strong enough to lift much more than the unit's weight, it is claimed, so will cling to the surface it is checking, allowing both of the operator's hands to be kept free to handle the detection

fluid. The unit can be operated for long periods of time without overheating.

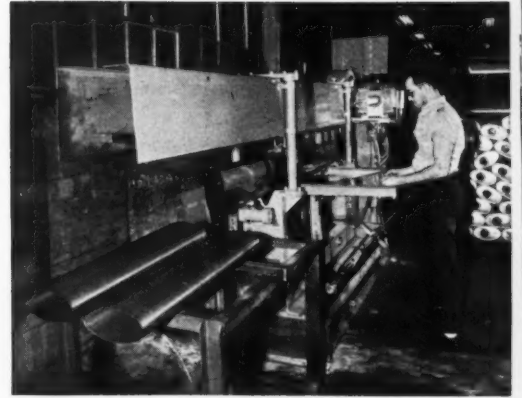
The operation of the unit is said to be very simple. The unit is placed on the part to be explored, so that both poles are in contact with the part, the current is turned on and the space immediately surrounding the pole assembly is painted with a solution holding minute particles of iron in suspension. These iron particles will concentrate wherever there is a surface or sub-surface break in the magnetic field. Such defects as cracks, laps, discontinuities, voids, slag inclusions, seams, grinding checks, hard spots, etc., are almost instantaneously disclosed, whether such defects are on the surface or at considerable depth beneath the surface. Also indicated will be tool marks, cracks, and stresses in bending, forming, heat-treating, and welding. If the unit is to be used on a large part or assembly, the two contacts should be placed on the surface and the switch turned on. An area approximately four inches around the contacts, and between them, can be covered with the inspection solution, and be visually inspected for particle buildups which indicate the presence of defects.

For further information, contact the Special Projects Editor, METAL PRODUCTS MANUFACTURING.

*Iron particles concentrate at point where there is a surface or sub-surface break in the magnetic field. Large parts or assemblies can also be inspected by covering area around, and between, contacts with solution containing iron particles. The unit will cling to the surface it is checking, allowing operator's hands to be kept free.*



At Mackenzie Muffler,  
workman is fabricating oval  
muffler shells from  
Youngstown Cold-Rolled  
Steel Sheets



## Accent on Excellence

### Youngstown cold-rolled sheets



Quieting today's 300-horsepower automobile engines to a barely audible whisper, are efficient mufflers made by Mackenzie Muffler Company of Youngstown, Ohio, that provide long-lasting service while undergoing the severest of climatic and operating conditions.

Mackenzie Mufflers, fabricated from shells of Youngstown Cold-Rolled Steel and internal components of Youngstown mechanical tubing, are found quietly at work under the flashy empenage of today's finest automobiles.

Wherever steel becomes a part of things you make, the high standards of Youngstown *quality*, the personal touch in Youngstown *service* will help you create products with an "accent on excellence".



THE  
**YOUNGSTOWN**  
SHEET AND TUBE COMPANY

*Manufacturers of Carbon, Alloy and Yaloy Steel, Youngstown, Ohio*



# Protective circuit breakers for the appliance industry

more complicated circuits, increasingly-complex  
appliances will require more protective devices

AN MPM ENGINEERING FEATURE



Circuit breakers used for appliance protection are increasing in use mainly because of the greater complexity of present day appliances. Another factor in this use is that the homemaker of today expects more trouble-free service from her appliances than she has been getting, according to informed sources.

According to A. M. Stone and M. F. Metzger, both of General Electric at Appliance Park, Louisville, Ky., a washer-dryer has a control circuit that

is more complicated than ever before. In a paper delivered at the AIEE-sponsored Appliance Technical Conference in Detroit, May 1957 (see *July, 1957 MPM for meeting*) entitled "Washer-Dryer Control System," one of the concluding statements pointed out that customers have come to expect a great many features which place a heavy obligation upon appliance design engineers. Control circuits are becoming more intricate, ever challenging the ingenuity; and as these circuits become more complicated, the possibility of malfunction caused by component failure is increased.

## Location a safety factor

Since normal practice, the paper continued, is to leave the machine completely unattended and, with installations in such areas as the kitchen, malfunction could cause more serious damage than is encountered in the more traditional basement installation. This emphasizes the desirability of protective devices and "fail-safe" features.

Stone and Metzger concluded their paper with the statement "... the designer is faced with the challenge to provide better control components and safety devices, and to utilize them in more ingenious circuits."

## For convenience outlets

Need for protective devices includes the individual circuits of the electric range and outlets for portable appliances located on the control panel of the range. At the present time there are at least two range manufacturers in the United States that utilize protective circuit breakers in either of two ways. Norris-Thermador makes use of circuit breakers for the individual circuits in the oven unit of their built-in line of ranges. Another manufacturer, Admiral, makes use of protective circuit breakers in the circuits that supply the portable appliance outlets.

## Canadian ranges protected

Every circuit in electric ranges made in Canada must be protected, and the

*A motor overload protective circuit breaker (arrow) as employed on the Philco-Bendix Duomatic washer-dryer. It is also possible to utilize a high limit thermally operated circuit breaker, a mechanically actuated circuit breaker which operates upon drive belt failure and for the back contacts on the motor centrifugal switch to prevent the heater from being turned on if the motor fails. The machine shown also employs a door actuated circuit breaker in addition to the motor overload protector.*





*The Norris Thermador built-in oven employs a protective circuit breaker for each of the two electric ovens shown here. The circuit breakers are visible as small round controls immediately to the right and left of the two center controls.*

most common method is by the use of manually reset circuit breakers. The subject of whether or not to protect ranges made in the United States as it is done in Canada has been brought up in various appliance meetings under the sponsorship of several trade associations and engineering groups, but nothing of a concrete nature has been decided as yet.

Timed, portable appliance control centers such as the built-in unit marketed by Westinghouse employ a circuit breaker for each of the outlets. In the event that one of the portable appliances draws excess current due to malfunction in the appliance the protective circuit breaker cuts the power to that outlet.

#### Definition

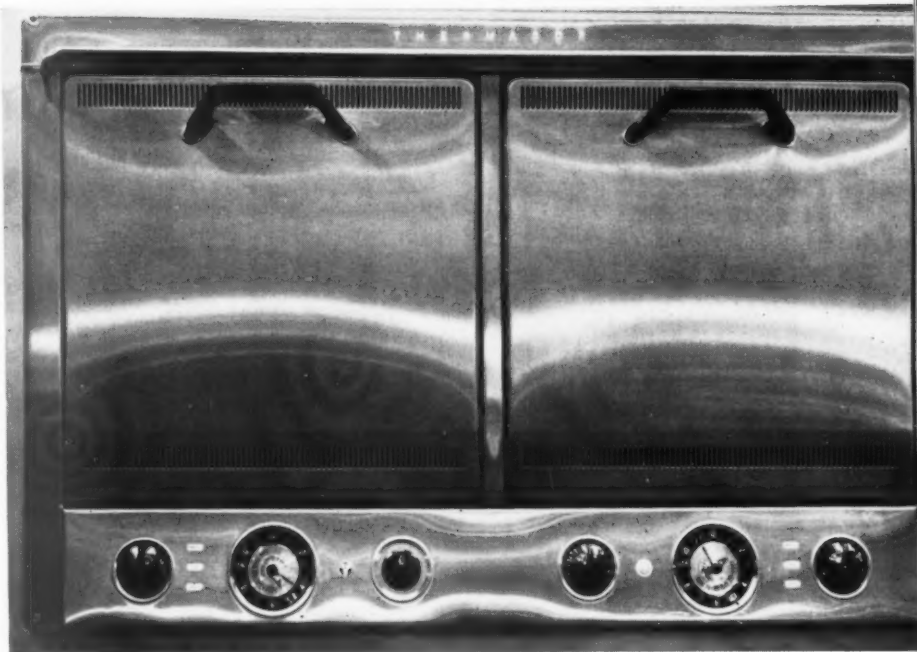
There is considerable overlap in the meaning of the term "circuit breaker." To heavy electrical equipment manufacturers, the term usually means an on-off switch which is sometimes combined with a current overload breaker. Switches of this type are often used as large electric motor-starter controls, and as protectors.

In the home, the FUSE has given way to the circuit breaker to provide reusable line overload protection. The essential difference between this type of circuit breaker is that it is usually rated for 15 amps, which is often well over the overload capacity of vital components of appliances.

An ON-OFF SWITCH is a manually-operated device for making, breaking, or changing the connections in an electric circuit.

A CURRENT ACTUATED CIRCUIT BREAKER is a device that provides reusable line overload protection and is actuated by current or by temperature. With deference to manufacturers of switches actuated by changes in temperature, this article will refer to these switches as *protective circuit breakers*, and not as thermostats. The reason for this is that the word thermostat means *temperature control*, not protective switching, to most people.

Current-actuated circuit breakers provide essentially the same protection to the line as does a fuse and, in addition, has a slight inherent delay which will handle momentary overload. The difference between a fuse and a current-



actuated circuit breaker is given by the following example: A motor drawing 5 amps at full load may draw 30 amps on starting; thus, a 5 amp fuse will blow before the motor gets up to speed. If a 30 amp fuse is used, no protection is afforded since this will allow the motor to draw 30 amps continuously which would burn up the motor. The motor would draw 30 amps under stalled rotor conditions.

A current-actuated circuit breaker, due to its delay characteristic, will in many cases allow a motor to attain running speed. However, the current-actuated circuit breaker cannot be termed a motor protector since it does not react to temperature.

CURRENT-TIME-TEMPERATURE CIRCUIT BREAKERS used for motor protection have inherent time-lag characteristics that avoid harmless transient shorts or overloads. These current-time-temperature devices are usually designed to match the current-time-temperature characteristics of the motor to which it is applied. A properly applied motor protector prevents the temperature of the motor from exceeding a predetermined value, yet allows the motor to be used until that maximum safe temperature is reached. This is true whether the overheating is a result of continuous overloads, lack of ventilation, mechanical failure, frequently repeated overloads, low voltage, or any combination

*The recently introduced Westinghouse timed portable appliance center utilizes a manually reset protective circuit breaker for each one of its five outlets. They are located at the upper right.*



PHOTOS COURTESY  
MECHANICAL PRODUCTS, INC.



*Though not visible here a protective circuit breaker is used on the top models of the Admiral range line. The current actuated circuit breaker is hidden by the electric fry pan at the right. This circuit breaker functions for both the timed and the regular convenience outlets.*

of these and other causes. Motor protector circuit breakers are not sold "off the shelf" to the public. They are installed in the motor during manufacture and may be manually reset or automatically reset, depending on the application.

A THERMALLY-ACTUATED CIRCUIT BREAKER is used either to control the temperature of a medium or to provide over-temperature protection. An example of this would be: Many domestic electric water heaters use control thermostats for controlling water temperature and a "high limit" for over-temperature protection. The high limit circuit breaker is usually a manual reset type.

#### The bimetallic disc

Most thermally-operated circuit breakers utilize bimetallic actuating elements. The bimetallic elements in circuit breakers can be made to operate at almost any temperature and with a wide range of time-lag characteristics.

The chart below will graphically show the means of actuation for the various

types of protective circuit interrupting devices.

The MECHANICAL CIRCUIT BREAKER listed in the chart is most commonly used as a safety door switch such as those employed on the doors of clothes dryers operating when the door is opened during operation of the machine. Another use is in connection with drive belts where, upon failure of the belt, power is cut off.

Following is a list of the ways in which protective circuit breakers could be, or are, used on various appliances:

#### RANGES

- (a) Individual surface unit circuit breaker.
- (b) Timed appliance outlet circuit breaker.
- (c) Regular appliance outlet circuit breaker.

#### WASHER-DRYERS

- (a) A high limit thermally-operated circuit breaker.
- (b) A door-actuated circuit breaker.
- (c) A mechanically-actuated circuit

breaker which operates upon drive belt failure.

- (d) Back contacts on the motor centrifugal switch. (Prevents heater from being turned on if motor fails).

#### WASHERS

- (a) A door-actuated circuit breaker.
- (b) A mechanically-operated circuit breaker which operates upon drive belt failure.

#### DRYERS

- (a) A door-actuated circuit breaker.
- (b) A high limit thermally-operated circuit breaker.
- (c) A mechanically-actuated circuit breaker which operates upon drive belt failure.
- (d) Back contacts on the motor centrifugal switch.

#### WATER HEATERS

- (a) A high limit thermally-operated circuit breaker.

#### CENTRAL HEATING UNITS

- (a) Mechanically-operated circuit breaker which operates upon drive belt failure.
- (b) A high limit thermally-operated circuit breaker.
- (c) Inherent motor protector circuit breaker.
- (d) Back contacts on the motor centrifugal switch. (Turns burner off if motor fails).

#### WASTE DISPOSERS

- (a) Mechanically-operated circuit breaker which operates upon blade jamming or failure.
- (b) Inherent motor protector circuit breaker.

#### APPLIANCE CONTROL CENTERS

- (a) Timed appliance outlet circuit breaker.
- (b) Regular appliance outlet circuit breaker.

#### Simplifies service

Much has been written about apparent lack of good service on appliances. Perhaps increased use of "fail safe" devices in appliances would go a long way toward solving this problem. Appliance manufacturers have done a great deal recently to eliminate trouble spots in their products. The addition of proven-useful components such as protective circuit breakers could be very helpful in this connection.

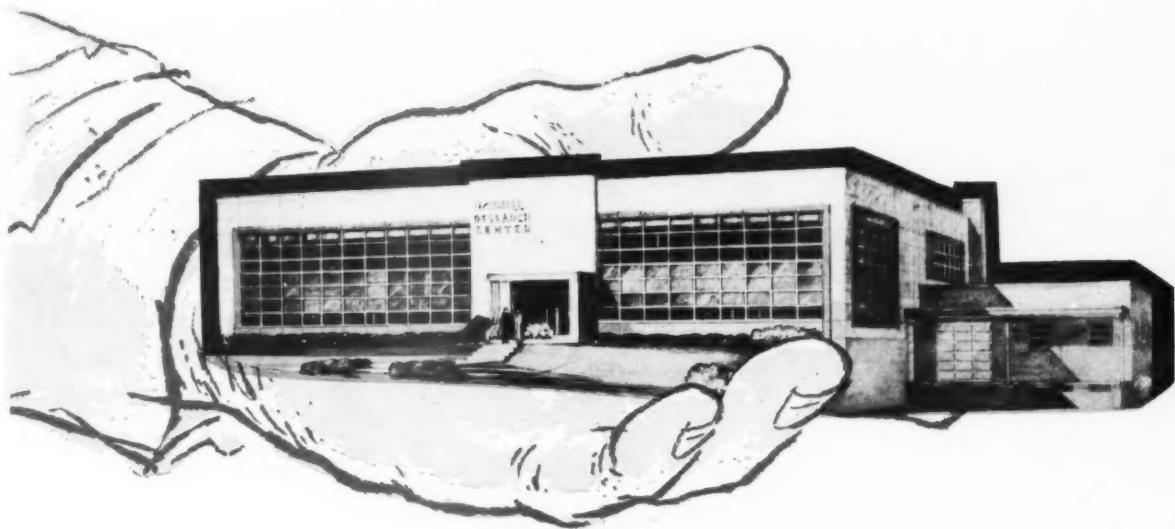
Editor's Note: A short supplement to this article showing the latest types of manually reset circuit breakers as used on major appliances will appear in September MPM.

DEVICE	MEANS OF ACTUATION			
	CURRENT	TIME	TEMPERATURE	MECHANICAL
Fuse	X	—	—	—
Circuit breaker, current	X	Slight Delay	—	—
Circuit breaker, current & thermal (motor protector)	X	X	X	—
Circuit breaker, thermal	—	—	X	—
Circuit breaker, mechanical	—	—	—	X

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# Reproducibility of alkali resistance testing

by Dr. John E. Cox • THE O. HOMMEL CO.

**D**UE TO THE CURRENT INTEREST in establishing an industrial standard test for determining alkali resistance of porcelain enamels (1, 2), it was decided to evaluate the influence of porcelain enameling processing variables on alkali resistance test data. It was desired to determine the degree of reproducibility or closeness of agreement which might be expected between test results of different laboratories. It was also desired to compare the reproducibility of the Porcelain Enamel Institute test apparatus with that of alternate methods of testing.

## Preparation of test specimens

All tests in this study were made with one commercial alkali-resistant cover coat porcelain enamel. Variables studied included firing temperature, firing time, slip age, slip fineness, and technique of spraying. With the exception of these specific variations, all processing variables were closely controlled. The slip was milled to the fineness of 0.6 grams on a 200-mesh screen, aged 24 hours, and adjusted to a specific gravity of 1.72 and a slump of 7 inches. An application weight of 20 grams/sq. ft. (dry) was applied by spraying, and specimens were fired at 1480° F. for 3½ minutes.

## Testing

Three different test procedures were used to evaluate these variables. Six specimens were evaluated by each procedure for each point of variation.

## PEI test apparatus

This apparatus is essentially as described by Roberts<sup>1</sup>, and has been designed by the PEI Subcommittee on the Development of Test of Alkali Resistance. The design of the heaters have been slightly modified since the above publication.

Specimens used were 3½ x 3½ inches, 20 gauge, enameling stock. Prior to testing, the specimens were thoroughly washed with a one-per cent solution of trisodium phosphate, rinsed with tap water, and then with isopropyl alcohol, dried, cooled in a desiccator, weighed, and exposed for two hours to a five-per cent solution of hydrated tetradosium

pyrophosphate at 90° C. After exposure, the specimens were washed with tap water, rinsed with alcohol, and again dried, cooled, and weighed. This procedure was repeated for two more two-hour exposure cycles, but all subsequent washings were made with only water. The average total loss in mg./square inch for six hours exposure for six specimens was reported as the alkali index.

## External specimen-mounting test apparatus

This test unit is similar in principle to that previously evaluated by the PEI Subcommittee. Six specimens are mounted externally, and tested simultaneously at 90°C with 21½ liters of distilled water containing 10 grams of anhydrous tetradosium pyrophosphate per liter (approximately a one-per cent solution). The specimens were tested for four two-hour cycles, washed, dried, and cooled between each exposure cycle, and fresh solution was used for each cycle. Alkali index was reported as the eight-hour loss in mg./square inch of attacked surface.

Since then, it has been used by others to investigate both alkali resistance and acid resistance.

In this work, specimens were subjected to two two-hour cycles of boiling tests with anhydrous sodium pyrophosphate solution of ten grams per liter. Each cycle was tested with 100 ml. of solution, and the results were reported as the total loss in weight in mg./square inch for four hours testing.

## RESULTS AND DISCUSSION

The results obtained with the PEI test apparatus were considered the most reliable since the apparatus and procedure were least subject to errors, and gave the best reproducibility.

## Reproducibility of the PEI test apparatus

The results for four different tests are shown in Table 1. Specimens prepared from three different slips prepared on different dates, and evaluated by two different operators, were used in this study.

1. J. T. Roberts, "Alkali Test — A Progress Report," *Proc. PEI Forum*, 18, 49-56 (1956)
2. E. E. Bryant, "A Controlled Boiling Acid Test for Porcelain Enamels," *Jour. Am. Cer. Soc.*, 20 (10) 317-19 (1937)
3. E. Skillicorn and J. E. Hansen, "An Alkali-Resistance Test for Porcelain Enamels," *Enamelist*, 24 (7) 16-20 (1947)

Results showed that for specimens from different batches of slip, and tested by different operators, the average six-hour losses were identical (4.22 mg./square inch). For a third milling, the results were very nearly the same, and were reproduced to within one per cent by different operators.

This degree of reproducibility indicates that the test apparatus is free from serious variables, and that porcelain enamels can be reproducibly prepared for alkali resistance evaluation. Actually, this degree of reproducibility is better than could be normally expected between results of different laboratories. Unavoidable errors in temperature control, weighing specimens, and in measuring the exposed areas, could conceivably cause results to vary as much as about three per cent.

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**Table 1**  
**REPRODUCIBILITY OF PEI**  
**TEST APPARATUS**

Slip* Batch No.	Operator No.	Average Loss mg./sq. in.	Standard Deviation mg./sq. in.
1	1	4.22	0.051
2	2	4.22	0.088
3	1	4.24	0.070
3	2	4.26	0.098

\* Attempts were made to keep all processing variables constant for these three slips, and for test specimens prepared from these slips.

## Boiling reflux test apparatus

This test unit is a modification of similar units reported in the literature. Bryant<sup>2</sup>, in 1937, reported the use of this type of apparatus for an acid resistance test. In 1947, Skillicorn<sup>3</sup> and Hansen adapted the test procedure to an alkali resistance test for porcelain enamels.

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MACCO 71-D is by far the most efficient and economical method of preparing metals for the finest and longest lasting paint job. Laboratory and shop tests prove that, on steel, cast iron, aluminum or die cast, MACCO 71-D provides a corrosion-resistant phosphate coating comparable in quality to that formerly available only through expensive and involved methods of preparation.

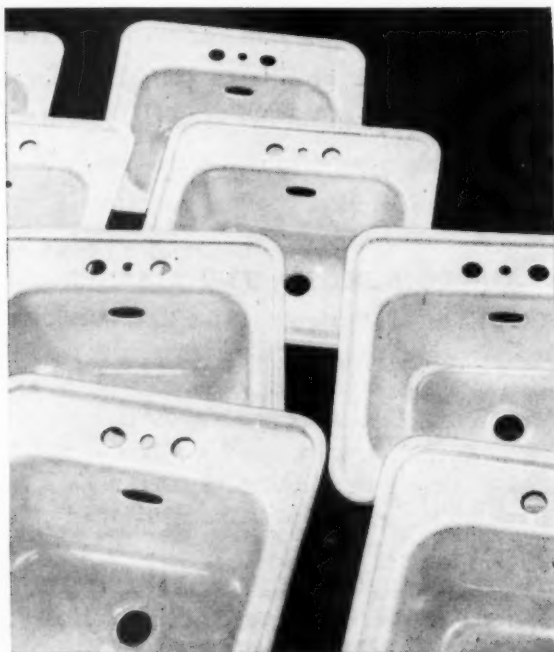
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**USS Vitrenamel draws deep, fires smooth,  
and resists warpage at high temperatures!**



At Federal Enameling and Stamping Company, McKees Rocks, Pa., they make a 14-inch draw on some sink models. For this, Federal *has* to use a ductile steel. That's one reason why they use USS\* Vitrenamel.

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## New housewares worth noting

**new bonding process for joining stainless steel and aluminum for fry pans; immersible appliances to facilitate cleaning; well known producer brings out a new clock line**

### Fry Pan Combines Aluminum and Stainless Steel

A new bonding process for joining aluminum and stainless steel was disclosed by Aluminum Co. of America at the National Housewares Show, when Toastmaster division of McGraw-Edison Co. exhibited an electric fry pan utilizing the two metals.

According to Alcoa engineers, the process, termed "pressure bonding," also offers possibilities for the use of aluminum in combination with such metals as carbon and alloy steels, copper, and other aluminum alloys.

In producing the new pan, Alcoa casts aluminum slugs which are then die forged, under exacting conditions, to a stainless steel pan body. The steel shell is the inside cooking surface. The new process makes it possible to obtain the heat conducting characteristics of aluminum, and to readily apply a heating element to a stainless steel pan.

### One Control Operates Five New Westinghouse Appliances

*A line of five new portable appliances which can be operated by a single control and each of which can be immersed fully into water for cleaning is being marketed by Westinghouse. The five are, l-r, the Dutch oven, 12-inch fry pan, three-quart sauce pan, griddle and 11-inch fry pan.*

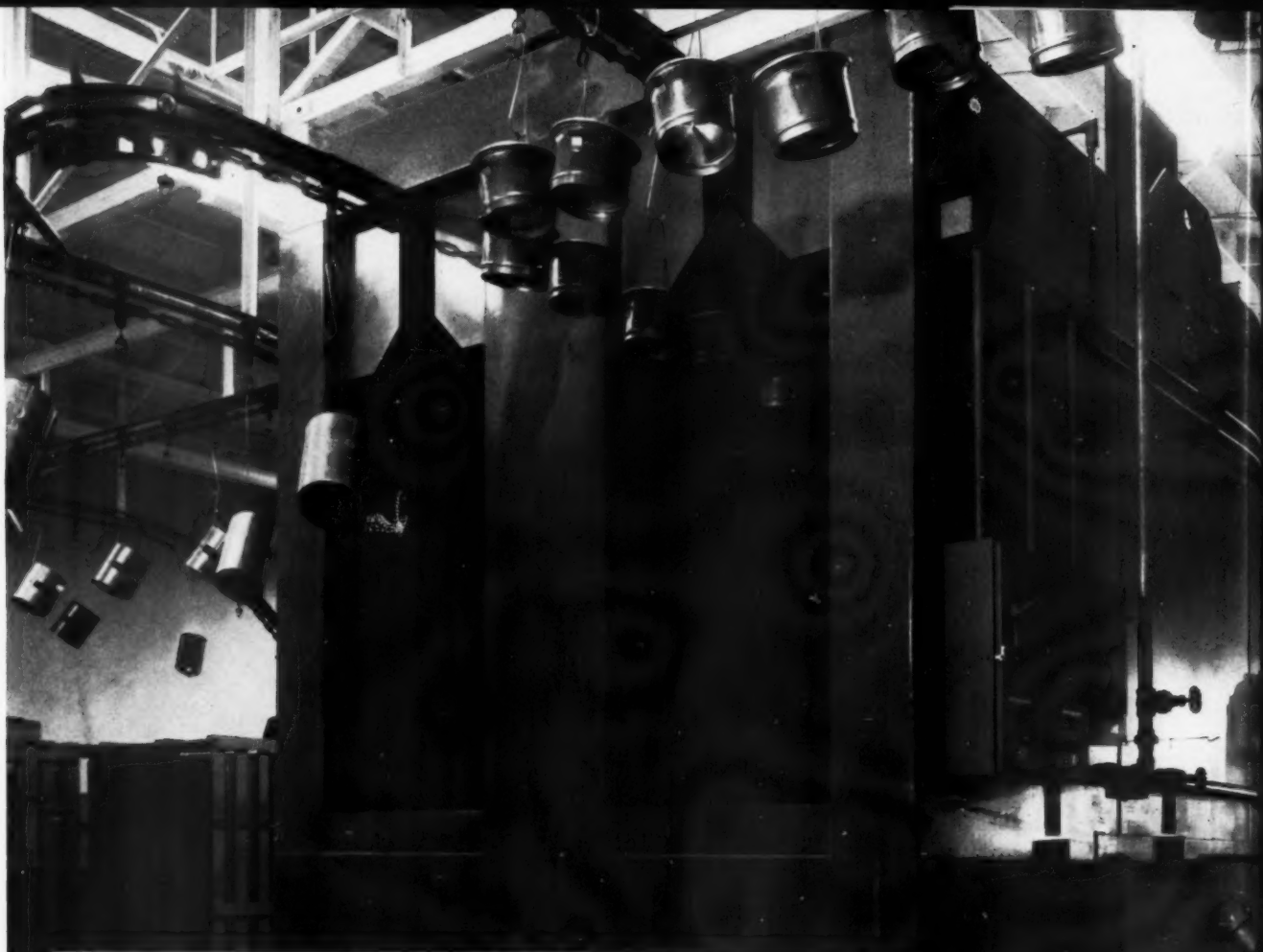


### Sunbeam Marketing New Line of Clocks

An all-new line of 36 electric clocks was introduced at Chicago recently by Sunbeam and shown later at the National Housewares Manufacturers Association in Atlantic City. The company executives here are William B. Courtney (r), Advertising Manager and Harold Blackburn, Product Manager. Feature of the new line of clocks is a compact, narrow motor unit that gives 25 times the power needed, according to Sunbeam. The slim design permitted by the narrow motor unit lends a "built-in" look to the new clock line.







## A double-duty organic finishing department

PHOTO COURTESY TRADE-WIND MOTORFANS, INC.

AN MPM STAFF FEATURE

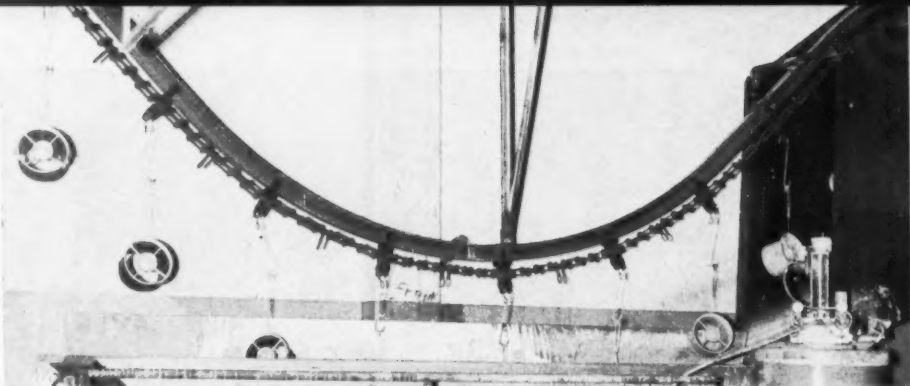
**dual-automatic  
washing machine and  
dual-function dip tank  
are features  
of compact installation**




At first glance, most modernized organic finishing departments seem monotonously similar. Conveyors, automatic washers, paint booths, bake ovens, and streamlined handling facilities . . . these are all anticipated trademarks. Sometimes, however, a second glance will be quite revealing, for only then do we notice specific engineering features which may make one department just a bit more efficient and less costly to operate than others.

This is the case in the 8500-square foot, \$148,000 organic finishing department completed recently at Trade-

Wind Motorfans, Inc., Rivera, Calif. Purpose of the new department is to apply a better grade of finish on the numerous models of domestic and commercial ventilating fans, ventilating equipment, and wall heaters which constitute the bulk of this company's output. Some of these products are hot-spray coated; others are dip coated in one of two colors. As a result of this, the new department is actually two departments in one—one for applying the spray coating, the other for dipping. The chief point of interest in this new department is the way in which some of the equipment has been made to serve dual-purpose functions.



Side view of the double-dip tank installation shows conveyor dip to service tanks.



End view of the double-chamber automatic washer and phosphatizing machine. One chamber treats parts for the spray booths; the other for the dip tanks. The same solution tanks and power facilities serve both chambers.

EXCLUSIVE MPM PHOTOS

End view of the double-chamber dip tank. Each chamber holds 450 gallons of paint, and can be placed directly under the conveyor chain by moving the wheel-mounted tank back and forth on short sections of angle iron track.

may run full-blast or shut down entirely without affecting the operations of the other. As the same solution tanks, power, heating, and drying facilities are used for both chambers (and in the subsequent dry-off oven), the installation can be described as "two powered, automatic washers in one."

The washing machine consists of three stages: Stage #1 is a combination alkali and iron phosphate wash. After a drain period, the parts are washed in clean rinse water (Stage #2) to remove the excess alkali and phosphate salts. Following the drain period, the parts are sprayed (Stage #3) with a dilute chromic acid bath.

Cost of this single installation was considerably less than the cost of two separate washers, and the transfer of parts from one conveyor to the other, which would have been necessary in a single-chamber machine serving both departments, has been entirely eliminated.

After the parts have been washed and phosphatized, they are dried by 350° F. air in the conveyORIZED dry-off oven.

#### Two colors from one tank

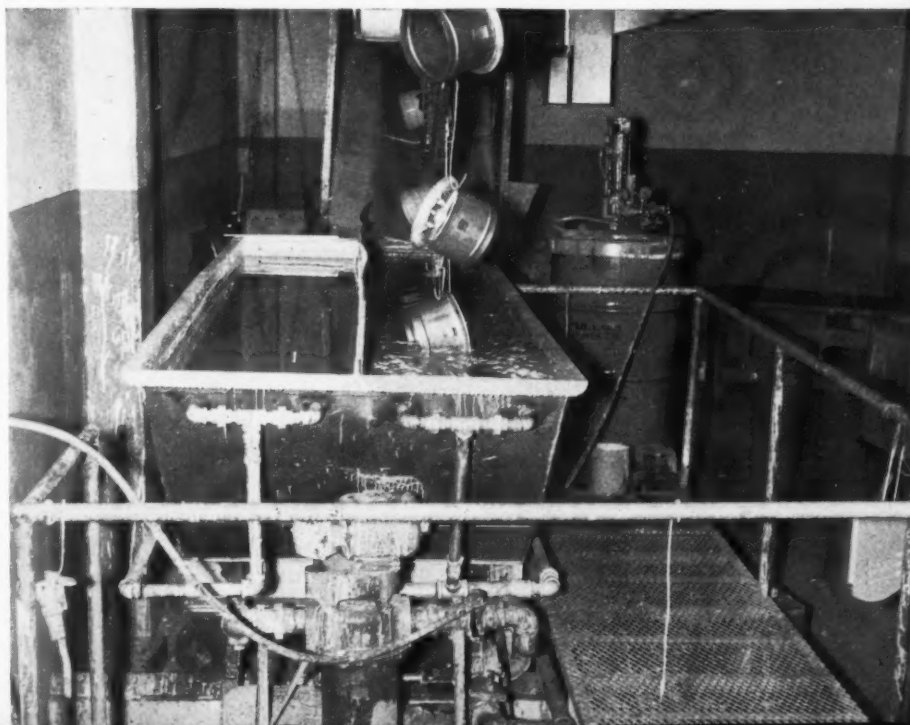
A second dual-function facility is the dip tank used in the dipping department. It was ascertained during design of the department that parts could be routed so that two dip colors would never have to be applied at the same time. A double-chamber dip tank was then designed, with each chamber having 450 gallons paint capacity. The tank chambers are side by side. The tank is mounted on four machined, V-type wheels, two at each end. The wheels ride on short sections of angle iron track mounted in the form of an inverted "V." In this way, it is possible to move the dip tank back and forth as desired, to bring the dip tank containing the needed color directly in line with the overhead conveyor.

Trade-Wind plant engineers point out that it would be easy to "self power" this tank so that it could move itself, but in this particular installation the frequency of movement would not justify the cost. A conventional lift truck is used to move the tank when a change-

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#### The double-chamber washer

The three-stage automatic washing machine and dry-off oven is a prime example of this. The washing machine is 48 feet long, 12 feet wide, and 13 feet high, and is equipped with eight motors, totaling 54 HP. Instead of installing an automatic washer in each section of the department so that interference between dipped and sprayed work would not occur, a single double-chamber washer was installed. Each chamber has its own conveyor chain — one eventually delivering the washed and phosphatized parts to the spray booths, the other to the dip tanks. Thus, either section of the new department





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## Reproducibility

→ from Page 30

### Effects of processing variables

Only the results obtained with the PEI test apparatus will be considered. These results are given in Table II. Specimens, which were prepared from slips aged 24 hours with a fineness of 0.6 grams, and fired at 1480° F. for 3½ minutes, were used as the basis for comparison.

### Firing temperature

Variations of firing temperature of ten degrees F. below and above the optimum firing temperature resulted in variations of only 1.9 per cent and 1.0 per cent respectively in the average value of weight loss. This degree of variation is probably not significant.

### Firing time

When the firing time was decreased or increased by ½ minutes, the average weight loss decreased 1.7 per cent and 1.2 respectively. A variation of this magnitude is not considered significant.

### Age of slip

When the age of the slip was increased from four hours to 24 hours, and then to 48 hours, the weight loss values decreased gradually. The losses for the four-hour age averaged 1.9 per cent high, and the losses for the 48-hour aging averaged 1.4 per cent low for a total variation of 3.3 per cent. This degree of variation may be of significance judging from results shown in Table I.

### Fineness of grinding

For a fineness of 0.1 grams, the average weight loss was 6.2 per cent high, and for a fineness of 0.9 grams, the average weight loss was 4.7 per cent high. Variations of these magnitudes are probably significant for results of this test apparatus, and the fineness of grinding is probably one variable which should be closely controlled.

### Technique of spraying\*

Results for the "smooth" and "rough" specimens show that the "rough" specimens lost an average of 5.9 per cent more weight than did the "smooth" specimens. This is probably a significant variation and would be expected since the increased "orange peel" on the "rough" specimens actually produced more surface for attack during exposure.

\* The "smooth" and "rough" classifications indicate the relative degree of "orange peel."

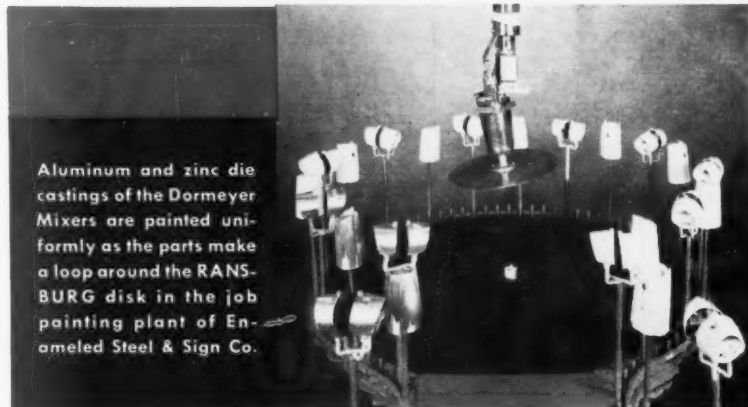
### EFFECT OF DRYING ON RESULTS WITH PEI TEST PROCEDURE

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... and high quality standards  
are easily maintained with Electrostatic Spray Painting



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*Ransburg*

ELECTRO-COATING CORP.

Indianapolis 7, Indiana

RANSBURG

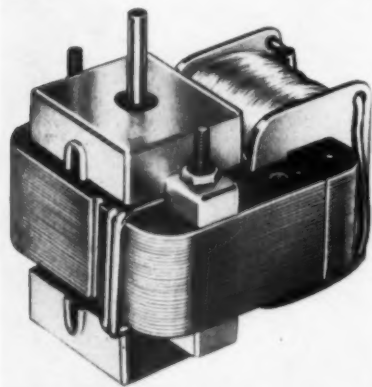
# NEW

## SUPPLIES & EQUIPMENT

### Shaded-Pole Motor

A 2-pole, shaded-pole motor, designed for applications demanding extra-long service life, has been developed.

Called the Model H, the motor is designed to hold considerably more oil and wicking, and is packed in a new unique manner that assures equal oil distribution at all times. The result is quieter bearing operation, less wear, and longer trouble-free service, even under unusually severe operating conditions.



Another feature of the H Motor is a rugged die-cast bearing bracket that insures precision alignment, and adds to over-all durability built into the motor. They are available in nine models ranging from 1/550 HP to 1/50 HP, and can be used with a wide variety of drives. Typical uses include: appliances, vending machines, small fans and blowers, phonograph turntables, floor heaters, projectors, centrifugal pumps, etc.

For further information, contact Dept. MPM, General Industries, Elyria, Ohio.

### Double-faced Tape

A double-faced pressure-sensitive adhesive tape, called Twin-Stick #9, has been announced. It consists of a light weight, porous, transparent paper carrier which has been saturated and coated on both sides with a clear, aggressive, super-aging pressure-sensitive adhesive. The rolls are available with a dry edge where the release paper overlaps the adhesive film by one-eighth of

an inch. It is claimed that the adhesive solves problems that involve putting two surfaces together. The tape is said to be especially useful in high speed operations for face-to-face assembly operations.

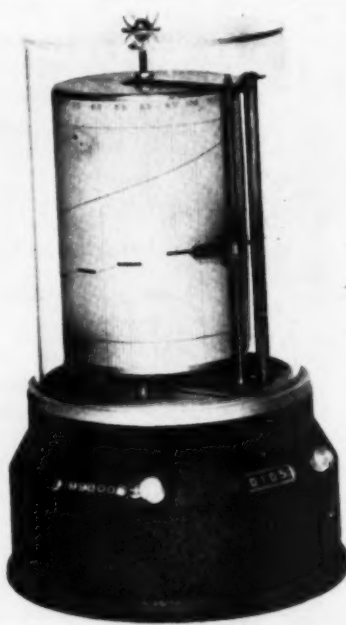
For further information, contact Dept. MPM, Durable Rubber Products Co., 609 W. Lake St., Chicago 6, Ill.

### Efficiency Recorder

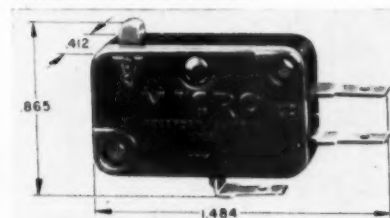
An efficiency recorder, which records by means of a single line on a chart the efficiency of operators, machines, and processes, has been announced. A tool for management, engineers, and operators, the chart shows the "on" or productive time as well as the idle or "down time." During productive time, the graphic line climbs upward at an angle. During "down" or idle time, the line instantly becomes horizontal, broad, and very conspicuous.

The unit consists of an aluminum drum driven by a constant speed electric motor. The stylus is inkless, and starts at the bottom and lower left end of the chart.

For further information, contact Dept. MPM, Gorrell & Gorrell, 338 Old Hook Rd., Westwood, N. J.



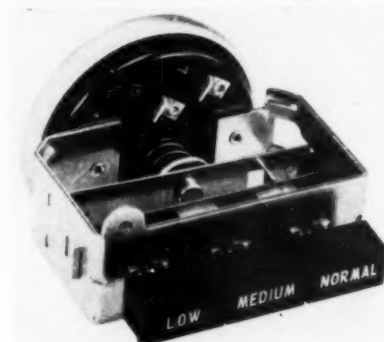
### Quick Connect Switch



A quick connect switch, Catalog Listing V3-1-D8, ultra-small in size, yet said to be high in electrical capacity, is available. It is claimed that lead receptacles can be attached in seconds, speeding up appliance and vending machine production line assembly. Contact arrangement is single-pole double-throw, and the switch may be wired normally-open or normally-closed.

For further information, contact Dept. MPM, Micro Switch, Div. of Minneapolis-Honeywell Regulator Co., Freeport, Ill.

### Pushbutton Water Level Switch



A reportedly simple, low-cost pressure switch to control the water level in automatic washers and dishwashers has been announced. The assembly contains a pressure-sensitive diaphragm that operates a snap-action switch. UL tested, it is rated at 20 amps., 1/3 hp, 115-230 volts ac.

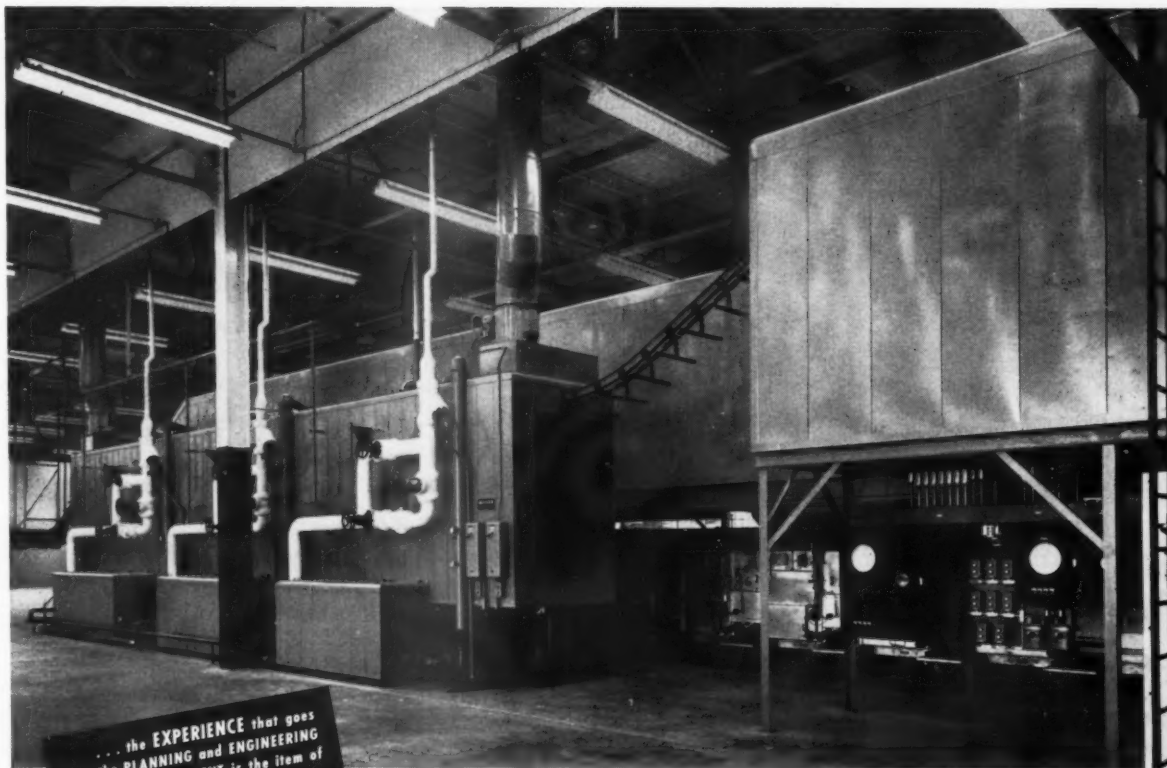
For further information, contact Dept. MPM, Acro Div., Robertshaw-Fulton Controls Co., Columbus, Ohio.

### Metal Fabric Has the Feeling of Cloth

A metal "fabric," manufactured by embossing color and texture on almost any metal to simulate artistically-woven cloth with threads of gold and silver, has been announced. Called "Croweave," the fabric-metal is "litho-loomed" in many colors, textures, and weave patterns such as Tweed, Bark Cloth, and Twill. The material is said by the manufacturer to offer the attrac-

to Page 50 →

# FINISHING SYSTEMS...



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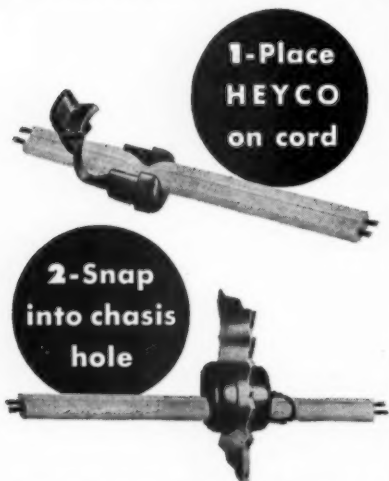
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# Announcing

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**September 1958 MPM**

*Here's a lineup of the features that will be published*

- Trends Worth Watching in the Home Laundry Industry  
Condensed statements by the "top brass" manufacturers
- An Exclusive Engineering Feature on a Completely New Product  
by a Prominent Producing Company
- An Exclusive (First Time Published) Engineering Feature on a  
New Transmission by Another Top Industry Name
- A Comprehensive Article by a Leading Authority on Fabric  
Softeners
- An Authoritative Business and Statistical Resume of Industry  
Progress
- 1959 Home Laundry Queen Contest
- The Spotlight on New Home Laundry Equipment & Components  
& Other Features

## Why Not Give Service and Charge for It? ★ ★ ★

We use Dictaphone dictating and transcribing equipment in our office, and battery operated Dictets for our editorial work in the field. We also use IBM electric typewriters and MMM duplicating equipment.

In all of these instances, the manufacturers offer periodic service and, in addition, have service men on a moment's call to keep the equipment in perfect operation. Of course, this isn't free. There is a substantial price paid for each unit serviced on an annual service policy basis.

The Hoover Company (vacuum cleaners) has always used the periodic service system effectively, both for keeping equipment in satisfactory operation and as a source for potential sales leads.

We were interested in a report from

an executive assistant in the office to the effect that locally, at least, Sears Roebuck & Company is suggesting service calls to users of their automatic washers.

The phone call suggests that a service call be made that would include inspection, oiling and any necessary cleaning or tightening and adjustment of parts and mechanism, etc. A standard service call price of \$5.95 would be charged. This is comparable to regular inspection by office equipment manufacturers.

It is interesting to note that the recipient of this call has decided to use this service. It may be unnecessary to suggest the survey and sales possibilities of a service call such as this, if properly handled by the proper personnel — in addition to its value in keeping the appliance owner happy. Eds.

# Chicago Vit HAS A CLAY FOR EVERY NEED



**X CLAY, Air-Floats** — X Clay has superior suspending properties and good workability. It produces excellent set and is widely used in ground coats because of its outstanding draining characteristics and bubble structure. It is also recommended for use with antimony cover coat frits, imparting high opacity.



**L CLAY, Hydro-Cleaned** — A clay with good suspension and set characteristics imparting good workability in titania opacified cover coats. It produces improved color, gloss and acid resistance.



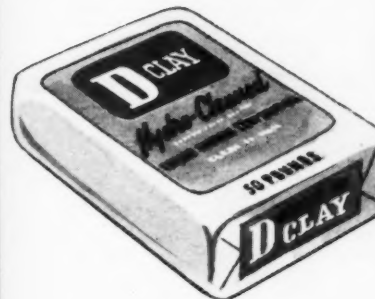
**H CLAY, Hydro-Cleaned** — H Clay has medium set characteristics. It has good workability in white cover coat enamels producing a medium bubble structure and opacity, and high gloss. It is often used with X Clay in ground coat enamels, and this combination is particularly advantageous for use in alkali resistant gray ground coats. It is well suited for use in lower firing as well as in conventional type enamels.



**Q CLAY, Hydro-Cleaned** — Q Clay is outstanding for dipping cover coat enamels where low set and high suspending power are desired. It provides excellent particle distribution during the dipping operation which results in a tight set with less tendency to double drain and assures a smooth texture.



**A CLAY, Hydro-Cleaned** — A blend of clays imparting outstanding scum resistance . . . an excellent clay for use in dark colored enamels. It is particularly compatible with oxides . . . provides good opacity and luster to opaque cover coat enamels. It has good suspending properties and develops average set permitting the use of relatively high specific gravities in enamel slips where this quality is desired for spraying.



**D CLAY, Air Floats** — A low bubble structure clay recommended for bright colored enamels. It gives excellent results in blue and black cover coats. Its suspension and set characteristics make it equally well adapted for use in both sheet steel and cast iron enamels.

We've learned a lot about clays for enameling over the past 40 years. Perhaps the most significant fact is that no one clay is suited for every use. The clay you use in your enamels should be one which has characteristics most suited to your product, the operating conditions under which your product is made, and the frits you use.

The study and development of clay blending and clay performance is one more unheralded service of the Chicago Vit

research and development laboratories. The over-all result is simply this: You can demand and get from Chicago Vit a clay that has been blended to impart particular characteristics that assure you of better enameling results and higher quality in your finished products.

You will find it advisable to discuss clays with your Chicago Vit representative. He will be pleased to recommend those most suited to your needs.

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## Do your drop rods hold up like this for 6 years? Wrought Inconel drop rods do

This drop rod served five years in a 1550°F enamelling furnace, holding fixtures and ware. Then it was transferred to a modern straight-through furnace for another year, where it's still at work.

Notice tightly adhering scale and the absence of any necking-down. It's ready for more years of service.

Take a tip from U. S. Porcelain Enamel Co., Los Angeles—where this

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Inconel burning tools are available from your fabricator. \*Registered trademark

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# INCO NICKEL ALLOYS



## Summer and fall humidity culprit in bad furnace atmosphere

**a major contributing cause of eggshell or pigskin, sponginess, poor gloss, overfiring, copperheads, scumming, blistering, black specking, and poor bond**

**F**URNACE ATMOSPHERE is something no one can see. However, it does play an important role in porcelain enameling results. While furnace atmosphere cannot be seen, it can be analyzed. And it is important for enamellers to periodically test their furnace atmosphere to determine whether deleterious gases are present. This should be a regular control procedure.

At times when processing defects occur many enamellers may overlook how harmful gases contribute to those defects. One of the first steps that should be taken at such times (particularly in mid-summer) is a test of furnace atmosphere. When bad furnace atmosphere has been eliminated as a cause of processing defects, then other causes may be investigated. But furnace atmosphere should be checked as one of the first possibilities.

For a furnace check three relatively simple tests can be performed — (1) Measure amount of carbon dioxide within the firing chamber; (2) Measure the amount of water vapor present in the firing chamber; and determine the presence of sulfur trioxide in the firing chamber. Values in excess of 1 per cent for  $\text{CO}_2$  and 2 per cent for water vapor are known contributors to enameling defects. The presence of small amounts of sulfur causes scumming of fired ware.

### Carbon dioxide

One of the most simple and reliable tests for the presence of  $\text{CO}_2$  can be made with an Orsat Gas Analyzer. The instrument is small and compact, making it easily transportable to any desired location. The instrument illustrated is shown in actual operation during the analyzing of a sample secured from the firing chamber of a gas fired muffle furnace. Visible are the three glass cells containing the selective absorbent liquids through which the measured volume of the gas sample is passed. With the instrument a gas sample can be analyzed for carbon dioxide, oxygen and carbon monoxide in a relatively short time. Usually it is only necessary to determine the amount of carbon dioxide.

### Water vapor

Detection of the amount of water vapor present in the furnace atmosphere is made with the Dewmeter. The Dew-

meter shown here consists of a mirror cup housed in a larger glass cylinder through which the atmosphere being tested is drawn by means of a rubber hose and bulb arrangement; the equipment includes a thermometer for measuring the temperature in the cooling agent; and suitable liquids of high vapor pressure which, by means of evaporation, can be made to produce a lowering in temperature of the mirror.

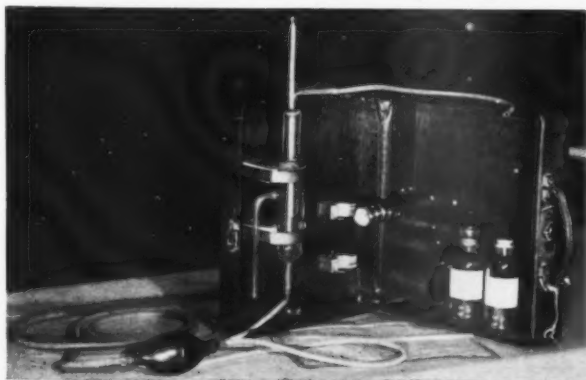
### Sulfur detection

An extremely harmful gas in furnace atmosphere is combined sulfur even when present in minute quantities. Scumming on the fired ware is evidence of its presence in the atmosphere. A simple method for the detection of sulfur trioxide, which is the form that produces scumming, is by pumping a large volume of atmospheric gas through a potassium iodide solution containing starch as an indicator. The change in color of this solution, from pale blue to colorless, indicates that reduction has taken place which is attributed to sulfur in either the dioxide or the trioxide form.

If during the humid days of August and early fall the defects listed as characteristic of furnace atmosphere trouble show up, it is urgently suggested that the simple tests outlined be conducted promptly. There is also equipment available other than the examples illustrated.

In the event enamellers are interested in more detailed technical information, it is suggested that they contact the frit service department of their commercial frit supplier or write to Special Projects Editor, MPM for a bibliography on the subject.

*Dewmeter, below. Orsat Gas Analyzer right.*



# Modern building wall adhesives and assembly techniques speed desk-top bonding



PHOTOS COURTESY RUBBER AND ARBESTOS CORP.



One of the important steps that any management can take toward lower costs and improved efficiency is to study the progress made by companies in other industries. A prime example of this in the metals field is the growing change-over by desk manufacturers from earlier bonding methods to some of the modern techniques and new adhesive formulations that were developed for high-speed fabrication of curtain wall panels in the building industry.

One of the country's leading manufacturers of office furniture (desks, tables, filing cabinets, bookcases, and special contract equipment "Nine-to-Five," a modular work station unit), Columbia Steel Equipment Co., Fort Washington Industrial Park, Fort Washington, Pa., has recently outlined, and permitted the photography of, these new procedures which they now use in bonding linoleum tops to their steel desks, conference tables, counter tops, etc.

In any quality metal desk, the working surface must be securely bonded to prevent any unattractive blisters from occurring as a result of the linoleum expanding or moving during service. While the blister may not materially affect the efficiency of the desk, the aesthetic value of a smooth work surface is destroyed.

As a result, some metal desk manufacturers have conducted extensive evaluations in order to select a strong adhesive and . . . even more important . . . a trouble-free method of bonding. The office furniture field is a highly-competitive one, so cost is an important consideration in converting production to any new method of metal desk fabrication.

*This view of office furniture shows a beautifully-finished, permanently-bonded linoleum desk top.*



## Styling is important

In addition, of course, considerable expenditure is devoted to the matter of styling, and it is therefore essential that the bonding materials and techniques are compatible with those design considerations demanded by the stylist.

Similar attention to design, rate of production, and cost-per-unit were the important factors in establishing the "thermoplastic bonding technique" for sandwich panel "curtain wall" construction in the building industry. Engineers at Columbia Steel Equipment adapted the same production techniques and bonding procedures to their own production facilities.

**Editor's note:** The technique described in this article for desk top bonding is also adaptable for fabricating plastic-faced cabinets, interior partitions, school furniture, and many other metal products, since similar adhesives will securely bond rigid decorative plastic laminates such as Formica, Micarta, Textolite, Conolite, etc., not only to steel but to hardboard, honeycomb, and other core materials.

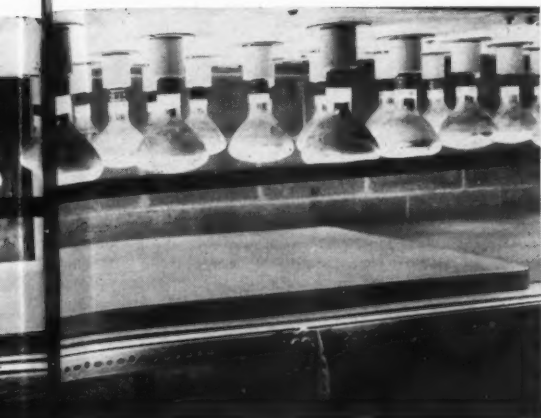
Thermoplastic bonding involves coating with adhesive both of the surfaces which are to be joined, and then forced-drying the cement to drive off all of the solvent and heating the adhesive film so that it is thermoplastic and tacky. Both coated surfaces are then mated and the strength of the bond is improved by putting the assembly under roller or plate pressure.

A variation of this is "contact bonding," in which both coated surfaces are allowed to dry until they are apparently tack-free. However, the adhesive films will adhere to a like-coated surface. The bond is immediate and strong.

## Seven-step procedure

The actual procedures used in producing the extremely-rugged, yet attractive Columbia Steel desks, follow:

1) The first step toward making the final bond is to spray the metal desk top with a specially-developed neoprene-based adhesive, based upon bonding



*This view shows method of drying or curing the adhesive a few minutes under a battery of infra-red lamps. The units are then ready to be bonded together.*

agents which were primarily developed for curtain wall construction.

This is a relatively-quick operation; the spray operator makes five or six passes with the spray gun, held at an average height of from one to one-and-one-half feet from the work, and the adhesive is applied evenly. To prevent the adhesive from coating the metal edge stripping, the top is edge-masked during the spraying operation. The top is then passed under infra-red lights.

2) The second step in the operation is to coat the underside of the linoleum top. It is spray-coated in the same fashion as above and also passed under the infra-red lamps to drive off the solvent and to heat up the adhesive.

3) The adhesive-coated desk top and linoleum are dried under a battery of 36 infra-red lamps in a matter of minutes.



*Here, Elmer Martin and Michael Rothschild line up the linoleum and apply it to the desk top.*

utes. (The heat drives off all the solvent so that there is no future problem of blistering or bubbling . . . no future problem of entrapped solvent causing blisters in the desk top at the consumer's location.)

4) The next step is an important one. Both coated pieces are removed from under the infra-red lamps and the adhesive-coated surfaces are mated. Plant management has found that the hotter the adhesive film, the better bond they get. The laminating step, therefore, is done as quickly as possible.

5) The linoleum top is cut over-size

*Elmer Martin, foreman, sprays desk top with adhesive. This is a quick operation; five or six passes with the air gun and the adhesive is applied evenly.*



so that, in the event the linoleum is not accurately placed, there is a latitude for slight human error. The adhesive will bond so strongly, immediately, that there is no opportunity for slight movement or adjustment if the parts are incorrectly positioned.

6) The linoleum top is then scribed to fit inside the heading strip on the edge of the desk top. This tool makes a perfect cut every time. The operators then make a final cut through the linoleum top with knives and break away the excess.

7) Finger pressure fits the cut edge of the linoleum top into place within the heading. A slight rolling . . . and another fine Columbia desk is finished.

#### **Many adhesives evaluated**

Columbia Steel Equipment had used and evaluated a number of adhesives, but the curtain wall contact bond-type was selected, they report, because "it does a faster job." It dries faster, improves production, has better adhesive qualities, and works better under fast-dry conditions. This has enabled the operation to be speeded up considerably. This type of "chemical fastener" offers another advantage; its improved sprayability (a characteristic that is relatively difficult to achieve in many types of adhesives) . . . it goes further . . . does more work per gallon . . . and results in cost savings."

The particular adhesive used by Columbia Steel was especially formulated to be very fast drying in order to attain





*Close-up view shows the adhesive power of the bonding agent as the linoleum is placed in contact.*



*Linoleum top is scribed to fit inside heading on edge of desk top prior to making final cut.*

maximum speed in fabrication. Other adhesives in the same general "family" have been adapted to offer more latitude in the timing of each step, in the heat output needed to get optimum drying temperatures, and other considerations which must be given in order to fit the specific requirements of the user.

Desk tops, counters, and file cabinet linoleum tops are made in similar fashion. The manufacturer has reported that the bonded assemblies have been

standing up very well. There has been no loosening of the linoleum . . . an understandable report since the very same type of product securely bonds

porcelain enameled steel and other similar materials to foamed glass cores on scores of building exteriors throughout the country.

#### **PRODUCTION SUGGESTIONS:**

- Type of adhesive described should be stirred well before using.
- Adhesive may be applied by spray, roller coater, spreader, or brush.
- Materials to be bonded must be clean and free of dust, grease, or water.
- Recommended atomization pressure is 60 psi, and fluid pressure 7 psi.

*Operator makes final cut through linoleum top with knife and breaks away excess material.*



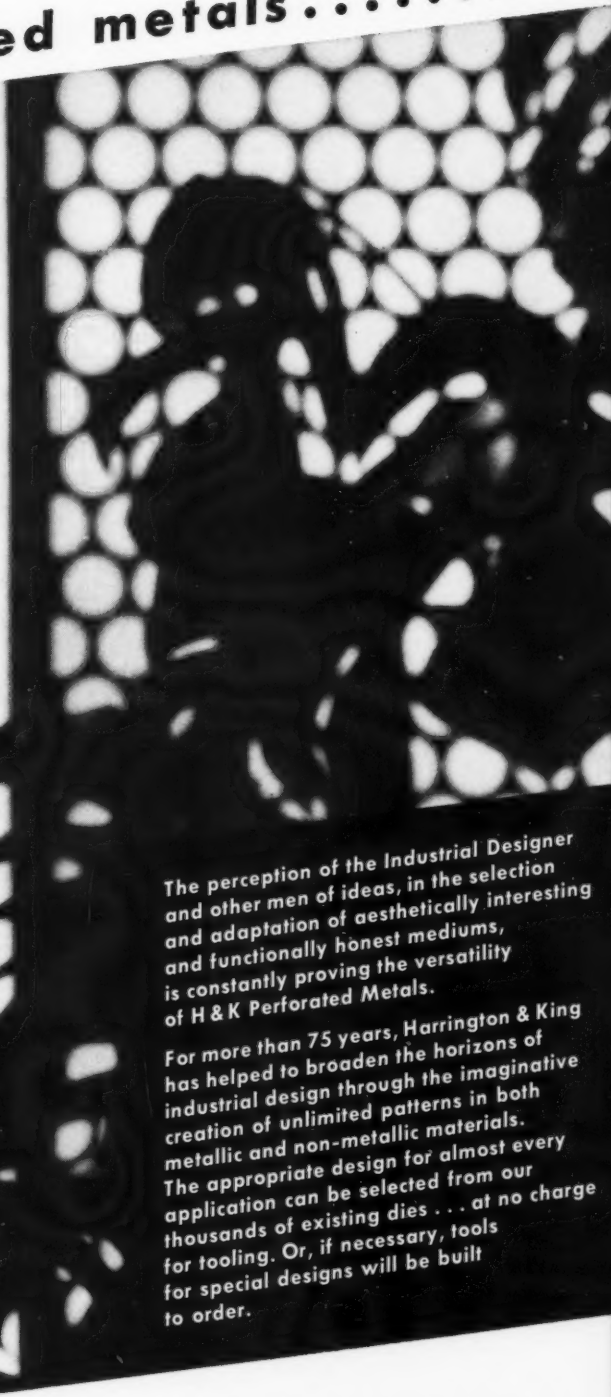
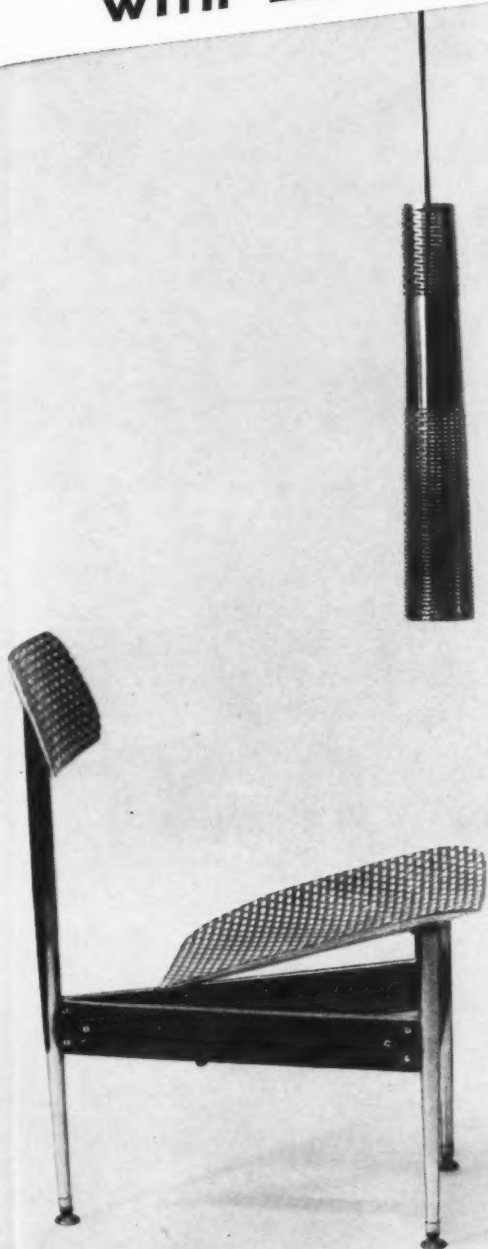
*Finger pressure fits the cut edge of the linoleum top into place within the heading of desk top edge.*



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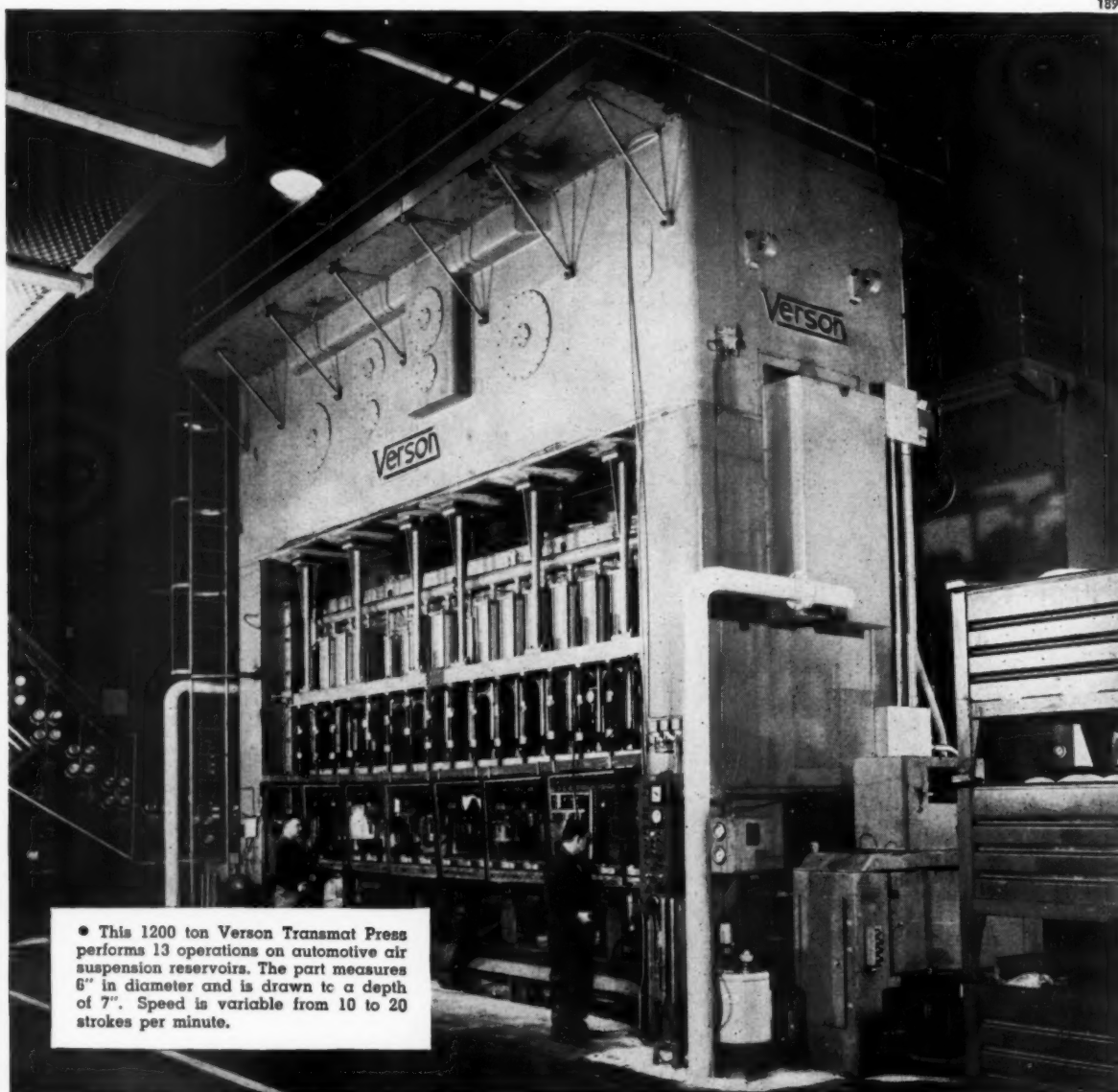


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# Republic Steel unveils new bar mill

AN MPM STAFF REPORT

THE "BAR MILL OF TOMORROW" was unveiled recently at Republic Steel Corporation's South Chicago plant before a battery of newsmen gathered at a press preview. Editors from trade publications observed what has been described by steel plant engineers as the most advanced bar mill now in operation in the American steel industry. Representing an investment of more than \$18,000,000 the mill produces alloy and carbon steel bar products.

Operations at the mill, which is semi-automatic, consist of uniformly heating three and four-inch square steel billets and then passing them through a series of alternate vertical and horizontal rolling stands where the steel is gradually reduced to specified size and shape. After the bars pass through the last mill stand, they are run off onto one of two cooling beds where they are gradually cooled before being sheared into specified lengths for shipment.

Incorporated in the mill are many unique features in design and operation. Some of them are: *Straightaway operation*—Utilizing the continuous mill principle, the steel being rolled is always moving in the same direction during its trip through the quarter-mile long mill. *Alternate horizontal and vertical rolling*—Alternate layout of the roll stands makes it possible to exert the necessary pressure on all sides of the steel without having to twist or turn it. *Vertical looping*—The first application in an American bar mill.

The heating furnace can provide sufficient steel to produce up to 85 tons of finished product per hour, and maximum delivery speed of the mill is 3,000 feet of finished product per minute, or at the rate of 35 miles per hour.

Each of the 16 mill stands is individually motor driven, and horsepower varies from 300 at the first stand to 800 at the last stand. Power for the motors

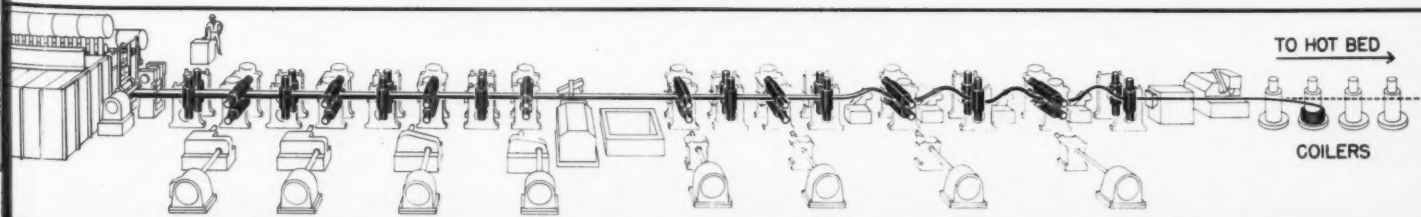
*Overall view of straightaway mill, with cooling beds at far left. Motors for vertical stands are beneath the floor.*

is supplied by two 3,500-kilowatt generators which are driven by a 9,800 hp, 6,600-volt motor.

The new mill is capable of producing the following range of products:  $\frac{3}{8}$  to  $1\frac{1}{4}$ -inch rounds, and the equivalent sizes of squares, hexagons, special sections, concrete reinforcing bars, and one-inch to four-inch wide flats. The entire range of sizes can be rolled in straight lengths, or into coils which weigh between 450 and 1,600 pounds.

Republic Steel's South Chicago plant, constructed during World War II, has nine electric furnaces, four open hearth furnaces, and reportedly one of the largest blast furnaces in the industry. The plant's annual steelmaking capacity is 1,697,000 tons of ingots.

*Vertical looping of steel, a unique principle in American bar mill design, is shown in photo at lower left. View of master control pulpit, lower right, shows air conditioned control room from which speeds of the 16 roll stands are synchronized and controlled. Line drawing at bottom of page is artist's conception of roll stand setup.*



## New Products

→ from Page 38

tive qualities of fabrics without the inherent risk of soilage, punctures, tearing, and fading. The metal is said to be easily machined and formed, and can be perforated for sound, air, or light transmission.

The material is said to be ideal for appliance trim, radio and television speaker grilles, housewares, interiors, etc.

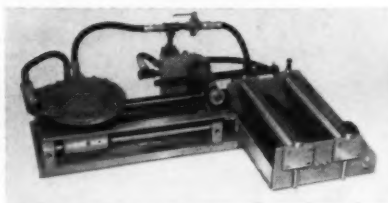
For free samples of this interesting material, contact the Special Projects Editor, METAL PRODUCTS MANUFACTURING, York St. at Park Ave., Elmhurst, Ill.

## Humidity Indicator

A humidity indicating device, called "Humigraph," is a card two inches by six and three-quarters inches in size, having seven indicator spots whose color changes from blue to pink as the atmospheric humidity changes. The card is scaled to show relative humidity by reference to the color change spots. It reads from ten per cent to 80 per cent relative humidity.

For further information, contact Dept. MPM, Andrew Technical Supply Co., 7068 N. Clark St., Chicago, Ill.

## Air Feed for Coiled Stock



A line of air feeds for feeding coiled stock materials to punch presses has been announced. Called Ses-Matic, the mobile-type air feed is designed to be moved from press to press, and is mounted on a bracket at the side of the press. The unit is actuated by movement of the press ram or die. Three models are available, accommodating stock widths from 1 to 30 inches, and stock thickness up to .090. Maximum stroke lengths are adjustable from 1 to 36 inches.

For further information, contact Dept. MPM, Special Engineering Service, Inc., 8161 Livernois Ave., Detroit 4, Mich.

## Flanged Water Immersion Heaters

Flanged water immersion heaters for use with new equipment, or as replacement units for domestic water heaters; laundry, dairy and laboratory equip-

ment; steam tables and generators; and dishwashers, have been announced.

Installation of the new tubular heaters can be made quickly and easily with four bolts, it is claimed. All-copper construction of the elements is said to provide rust-free durability. The heater head flange is reinforced by a heavy-duty steel back-up plate for maximum strength.

For further information, contact Dept. MPM, General Electric Co., Schenectady 5, N.Y.

## Stainless Steel Sheets

Stainless steel sheets and plates, in lengths up to 20 feet, and in widths up to 72 inches, can now be supplied in high production runs with Nos. 3 and 4 finishes. Polishing of 72-inch sheet, formerly available only through mill sources, is made possible in both precision and volume through the use of new wide-sheet polishing machinery. In addition, it is used in combination with other straight-line production equipment to provide a quick-delivery one-source supply for a complete range of finishes, sizes, and thicknesses.

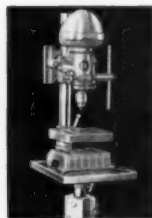
For further information, contact Dept. MPM, Apollo Metal Works, 66th Place and S. Oak Park Ave., Chicago 38, Ill.

# POWER TOOL TABLE

This Power Tool Table was first designed and built in our shop to meet our own tough engineering purposes. It proved itself so versatile, so sturdy, it has been put into production and now is available to you.

## Hi-tensile Cast Iron

Slotted table top mounts different sizes and types of power tools: jigsaw, grinding wheel, vise, drill press, pipe threader.



**SPECIFICATIONS:** Height: min. 33 3/4", max. 40". Area occupied: under 2 sq. ft. Weight: approx. 70 lbs. Table top size: 12" x 12". Table top rotation: 360°

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811-12th Ave. N.  
Nashville, Tenn.

**\$28<sup>50</sup>**



**NON-TIPPING**

# NEW

## INDUSTRIAL LITERATURE

### Zinc Coating Resists Flaking and Peeling

The cost of applying protective coatings or plating and reduced production time are said to be the advantages of this manufacturer's zinc coated welded steel tubing. This tubing has a special hot-dip zinc coating. It is said to have the ability to be formed to the limits of the base metal. For complete information on diameters, gages, and shapes available contact Dept. MPM, Armco Steel Corp., 2478 Curtis St., Middletown, O.

### Two Temperature Sensor Bulletins

Separate bulletins are available on two basic types of temperature sensor devices. One is on a bellows type assembly that is said to provide accurate control with no drift for cold or heat sensing applications such as oven and refrigerator controls. Simple in design and lightweight, they are replaceable with costlier sensing devices, according to the manufacturer. So-called Diastat assemblies eliminate the need for ambient temperature compensating devices in many applications, it is said. These stainless steel "packaged" units reportedly offer extreme accuracy with no resetting at temperatures up to 650° F. For the Bellows Bulletin K-105 and the Diastat Bulletin K-607 write Dept. MPM, Bridgeport Thermostat Div., Robertshaw-Fulton Controls Co., Milford, Conn.

### New Bulk Pack for Screws Saves Storage Space

A new method of bulk packing for screws is said to save space in storage and simplify materials movement. This redesigned bulk packing system features a new telescopic bound carton, 9 in. by 9 in. by 6½ in., of 275 pound test corrugated board construction for higher stacking and easier handling; and, adoption of a standard disposable 30 in. by 30 in. two-way entry pallet, carrying 4 layers of 9 bulk cartons each, with protective steel strapping. Write for the new chart BP-1, which defines these standard packing quantities. Dept. MPM,

Southern Screw Co., Box 1360, Statesville, N. C.

### Sheet Steel Fabrication Facilities—From Design to Finished Product

Complete fabrication facilities are available for a wide variety of sheet steel products that can be marketed under the manufacturer's brand name. Large stocks of standard tools, dies and specialized equipment for punching, shearing, forming, welding and phosphatizing are available. Detailed information on Republic Steel's Berger Division are included in Bulletin 1090. By sending a sketch or a blueprint with complete specifications this division can tell what their specialized services can do. Write Dept. MG-6073, Republic Steel Corp., 1441 Republic Bldg., Cleveland 1, O.

### Bulletin on New Thermosetting Acrylic Finish

A new thermosetting acrylic finish is completely described in a newly available bulletin. The new finish is said to improve all-around protection and give lustrous beauty to appliances and other fabricated metal products. Vitri-lan, as the new finish is known, reportedly combines the color retention, the chemical and abrasion resistance of the acrylics with the hardness and toughness of a baking enamel. Write Dept. MPM, Finishes Div., Interchemical Corp., 224 McWhorter St., Newark 5, N. J.

### Cast-In Heating Elements

A cast-in electric heating element that is said to heat up faster, has even heat distribution and that lasts longer is completely described in a new four page folder. Called Adaptatherm by the manufacturers the heating element has several other advantages. Write Dept. MPM, H. W. Tuttle & Co., Adrian, Michigan.

### Thermosetting Acrylic Finish Brochure

According to a new brochure available one coat of Duracron effectively does the work of the conventional two-

coat finishing system. The finish is made available in a wide range of properties, it can be sprayed, dipped or roll-coated. It can be used as a one-coat enamel or as a top coat with various primers. For the descriptive brochure Contact Dept. MPM, Industrial Finishes Div., Pittsburgh Plate Glass Co., 1 Gateway Center, Pittsburgh, Pa.

### New Paint Stripper for Epoxy-Coated Parts

A new paint stripper is on the market which enables stripping of metal parts that have been imperfectly coated with epoxies, vinyls, polyesters and other hard-to-strip paints or lacquers. The new paint stripper is called Oakite Stripper S-A and is described in a new bulletin. Contact Dept. MPM Oakite Products, Inc., 17 Rector St., New York 6, N. Y.

### Modern Ways to Achieve Better Finishes

Complete finishing system information is included in a bulletin from a company that specializes in engineering finishing systems. In one plant it is said that 300 per cent greater capacity was achieved with one of these finishing systems. For bulletin No. 51 write to Dept. MPM, Despatch Oven Co., 619 S. E. Eighth St., Minneapolis 14, Minn.

### Shipping Containers for Every Use

Large or small containers for every purpose are completely described in a free illustrated catalog. Wire bound pallet boxes, hinged corner pallet boxes, cleated boxes, various types of crates and corrugated boxes are fully described. All of these containers can be easily and quickly assembled and allow high stacking, according to the brochure. For the catalog write Dept. MPM, Chicago Mill and Lumber Co., 33 South Clark St., Chicago 3, Ill.

### New Phosphating Material

Development of a new phosphating material to provide a tight bond for paint, other organic finishes and for metal drawing has been announced. The new material deposits a zinc phosphate coating on iron, steel, zinc and cadmium of up to 400 milligrams per square foot. The new material reportedly meets USA-57-0-2C, Type II, Class C and MIL-S-5002. Detailed technical literature on Turco 4333 may be obtained free of charge by writing MPM, Turco Products, Inc., 6135 South Central Avenue, Los Angeles 1, Cal.



### Maximum Finishing Oven Efficiency

Six questions are answered in a new booklet which carries the title above. Some of these are: Does the finishing system have capacity for increased production?; Is the equipment simple enough to allow easy maintenance?; What type of materials handling is best suited for a particular process in production? These are just a few of the questions answered in this booklet. For free copy, write METAL PRODUCTS MANUFACTURING, York St. at Park Ave., Elmhurst, Ill.

### Solenoid Selector and Free New Bulletin

A complete booklet describing the many applications of solenoids is available, along with a solenoid selector that quickly and easily matches a solenoid to a specific application. Applications include valve actuation, clutch operation, switch function, metering devices, shutter and damper control, and many other operations. For the free bulletin and solenoid selector, contact METAL PRODUCTS MANUFACTURING, York St. at Park Ave., Elmhurst, Ill.

### Precision Snap Switches

Two new bulletins on two types of snap switches are offered. Bulletin 263-B is for class 1 TyniSwitch which are top mounted and top actuated, with a wide choice of terminals and actuators. Bulletin 270 is for class 4 TyniSwitch which is side mounted and top actuated, with a choice of actuators and terminals. It is stated that these TyniSwitches are smaller in size than other snap switches of equal rating, yet they provide the maximum degree of operating efficiency. They are also said to be virtually bounceless, and to be exceptionally resistant to shock and vibration. Write Dept. MPM, Detroit Controls Div., American-Standard, P. O. Box 741, Bridgeport 1, Conn.

### New Fractional H. P. Motor Catalog

A newly revised and enlarged "Smooth Power" fractional H. P. motor catalog is now ready for distribution. It contains illustrations, descriptions, and specifications of eight basic motors, with a total of 36 model variations, ranging from 1/1800 to 1/35 H. P. A new model motor is described in the booklet that is especially designed for applications requiring unusually long service life, according to the manufacturer. It features extra large oil reservoirs, die-cast bearing brackets, and a new method of packing the wicking to insure equal oil distribution at all times under rugged service it is said. Copies of the new catalog can be obtained by writing Dept. MPM, The General Industries Co., Elyria, O.

### New Palletainer Catalog

A new 18-page catalog on USP Palletainers, for all types of materials handling, is now available. This comprehensive catalog contains a broad variety of in-use photographs of the various Palletainer, steel mesh container models. Consolidated specifications, capacities, base plans and side or end gate details for the broad range of models are shown in a new easy-to-read form. For your free copy write Dept. MPM, Union Steel Products Co., Materials Handling Equip. Div., Albion, Michigan.

### Perforated Metals Versatile Design Tool

Perforated metals have been incorporated into today's products with ideas that have proven themselves. A booklet is available which describes "Perforated Metals for Every Purpose" and is based on ideas gained through 89 years of experience as specialists in the use of perforated metals. For a free copy write Dept. MPM, Charles Mundt & Sons, 55 Fairmount Ave., Jersey City 4, N. J.

## FICTION and FACT



**RP**  
**PAINT ARRESTORS**

#### FICTION:

R P Paint Arrestor Equipped Booths Cost More than other Methods of Paint Overspray Removal.

#### FACT:

Comparisons Show R P Paint Arrestor Booths' Operating Cost 30-50% Less than Water Wash Booths of Equal Size.

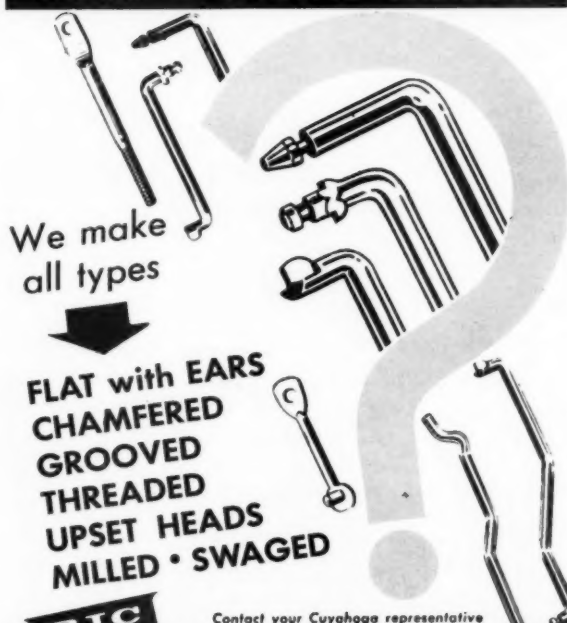
Photo Courtesy American-Standard, Elyria, Ohio Plant

R P Paint Arrestors save money in other ways, too. Maintenance is simple—labor costs average 40 to 85% less than for equivalent water wash booths. Down-time is reduced considerably, production is increased, less floor space required. And, with all the savings, R P Paint Arrestors are more efficient—and adaptable to almost every type operation. Write for more information.

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Dept. 39, Madison 10, Wis.

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**RIC**  
REPUBLIC INDUSTRIAL CORPORATION  
**The CUYAHOGA SPRING Co.**  
10200 BEREA ROAD • CLEVELAND 2, OHIO

## Reproducibility of alkali resistance testing

→ from Page 37

**Table II**  
**EFFECTS OF PROCESSING VARIABLES**

Test No.	Processing Variable	Value of Variable	Average Loss 6 hrs. mg./sq. in.	Standard Deviation mg./sq. in.
1	Temp.	1470° F.	4.14	0.069
2	(for 3½ min.)	1480	4.22	0.051
3		1490	4.18	0.028
4	Time	3 min.	4.15	0.034
2	(at 1480° F.)	3½	4.22	—
5		4	4.17	0.037
6	Slip Age	4 hrs.	4.30	0.100
7		24 hrs.	4.22	0.088
8		48	4.16	0.063
9	Fineness	0.1 gms.	4.48	0.066
2		0.6	4.22	—
10		0.9	4.42	0.069
7	Surface Texture	Smooth	4.22	—
11		Rough	4.45	0.206

The usual procedure for use with the PEI test apparatus was modified slightly to eliminate the drying, cooling, and weighing after the first two exposure tests for the purpose of decreasing the overall time of testing. Results of these tests are shown in Table III, and indicate that the drying between every exposure cycle may possibly be a significant variable in the test procedure. The difference in the average weight losses between the two different procedures was only 2.4 per cent, but for these tests the exposed areas and processing variables were consistent. More data is needed to properly evaluate the effect of drying.

### COMPARISON OF RESULTS BY OTHER TEST METHODS

Both of the two other alternate test methods give results which, within limits of experimental variation, would agree with the results obtained on the PEI test apparatus. However, both of these alternate test methods are subject to considerable variation, and are inferior to the PEI test apparatus in regard to reproducibility.

**Table III**  
**EFFECT OF DRYING ON TEST RESULTS**

Test No.	Procedure* Designation	Average Loss mg./sq. in.	Standard Deviation Mg./sq. in.
1	A	4.24	0.070
2	B	4.29	0.033
3	A	4.26	0.098
4	B	4.34	0.070

\* Procedure "A" was the usual procedure, and in procedure "B," the drying, cooling, and weighing were eliminated after the first two cycles of exposure.

### Externally-mounted

#### specimen apparatus

Reproducibility of results with the test apparatus is probably within only about

ten per cent. Considerable variation, due to variation in ambient temperature\*, can be expected with this apparatus. This effect of ambient, or back-side, temperature of the test specimen can amount to variations of approximately ten per cent due to variations in room temperature. Roberts, in his report of results for internally- and externally-mounted specimens, showed the pronounced effect of this temperature on weight losses. Experiments of the author have indicated that the results will vary about 10 per cent/10° C. change in ambient temperature.

Some design or procedure variables are also apparent with this apparatus. The standard deviation of six specimens was of the order of magnitude of 0.1 to 0.2 mg./square inch in the range of weight loss of 3.4 mg./square inch, and the coefficient of variation was about four to six per cent as compared to only about one to two per cent for the PEI test apparatus. This per cent variation becomes increasingly significant when it is realized that all six specimens are tested simultaneously with the same solutions.

This apparatus was originally designed for long-time testing at reduced temperatures, and is not well suited for two-hour tests. Relocation of the specimens for repeated runs was the cause of some variation, since no provisions were provided for exact replacing of the specimen.

Another source of difficulty was the handling of the specimens between several tests. Due to the method of holding the specimen in place, some chipping of the specimen occurred, and some loss in data was therefore experienced. It is also likely that some unnoticed chipping

\* The ambient temperature here referred to is the back-side temperature of the test specimen during exposure.

was the cause of variations in results.

### Boiling reflux test apparatus

Results with this test apparatus can be expected to vary up to ten to 15 per cent for one operator, and may conceivably vary as much as 40 per cent for tests by different operators.

The most significant source of error is the flame method of heating. Controlled tests have shown that the back-side temperature of the test specimen can vary as much as ten degrees C. for burners which are repeatedly adjusted by the same operator. This specimen temperature may vary up to 30° C. if the burners are adjusted by different operators, depending upon the judgment in adjusting the burners. Consequently, results could vary as much as 30 per cent for identical specimens tested in different laboratories.

Another significant error is the atmospheric pressure. Changes in the atmospheric pressure can change the boiling point of the test solution approximately one degree C., and in the range of 100° C., this can change the weight loss approximately ten per cent.

Alkali resistance testing with the reflux apparatus as used in this work may be satisfactory for comparing enamels where a relatively great difference in alkali resistance exists but, for comparing two very similar compositions, this test method is not satisfactory.

### CONCLUSIONS

Within the limits of this investigation, the following conclusions seem justified.

1. The PEI alkali resistance test apparatus gives results which are reproducible to within about three per cent.
2. Alkali test results for a given alkali resistant porcelain enamel may be duplicated to within about three per cent by different laboratories, if the frit and other mill additions are the same, and if the PEI test apparatus is used.
3. The most significant processing variables evaluated were fineness of grinding and surface texture. The age of the slip may have a slight effect on alkali test results. Moderate variations in firing time or temperature do not appear to be significant.
4. In the procedure of the PEI test apparatus, the drying after each exposure may possibly affect the six-hour weight loss results. More data is needed to properly evaluate this variable. By omitting the drying cycles after the first two cycles of testing, the over-all time of testing for three specimens can be reduced by about two hours.
5. The PEI test apparatus is far superior to either of the others used in this work.

*Adapted for Metal Products Manufacturing from a paper presented at the 19th Annual Shop Practice Forum of the Porcelain Enamel Institute Columbus, Ohio November, 1957*



### **Ranks of Aluminum Fabricators Growing, Report**

The recession has not hindered the growth of aluminum fabricators in the six-state area of Pennsylvania, New Jersey, Delaware, Maryland, West Virginia, and Ohio, according to a study released by Karl G. Seelaus, executive vice president of Factors Corp. of America. There are now 5,784 manufacturers who fabricate aluminum into end products, and they employ 160,000 people. These manufacturers comprise about 26 per cent of the industry, and major growth during the current year has been in the use of aluminum in building materials and consumer durable goods.

### **Chambers Appoints New Distributors**

Chambers Built-Ins, Inc., Chicago, has appointed new distributors in the Chicago area to handle a complete new line of matched and packaged built-in kitchen appliances.

Arthur H. Scheffer, national sales manager, has stated that the company is the first firm to market a full built-in line including gas and electric ranges and ovens, refrigerators, freezers, kitchen disposers, ventilating hoods, and dishwashers.

### **Westinghouse Transfers Electric Heater Facilities**

The Westinghouse Electric Corp. has transferred responsibility for manufacturing and marketing of electric heating equipment from Sunnyvale, Calif., to its air conditioning division plant at Staunton, Va.

Bruce D. Henderson, vice president in charge of the air conditioning division, said that the transfer was decided upon because "the production and sale of electric heating equipment is more closely associated with the activities of the air conditioning division than with those of the Sunnyvale division."

### **Professor Weck to Lecture**

Professor Richard Weck, Cambridge University, England, director of the British Welding Research Association, author, and chairman of the Commission on Residual Stresses of the International Institute of Welding, will be lecturer for a "Seminar on Residual Stresses" to be conducted at Cleveland, Ohio, October 30-November 1. The seminar is to be conducted by the American Society for Metals, and the series of lectures will be delivered in the Wade Park Manor, Cleveland.

### **Automatic Ignition Mandatory for AGA-Approved Ranges**

The American Gas Association has announced that all gas ranges must be completely equipped with automatic ignition in order to qualify for the AGA seal of approval after next January 1.

The AGA board of directors, meeting recently at Hot Springs, Va., voted to make automatic ignition for ovens and broilers mandatory at the beginning of 1959. Automatic ignition of top burners has previously been required for gas ranges bearing the approval seal. Automatic ignition for commercial gas cooking equipment has been in effect since January, 1957.

### **1957 Proceedings Published by ASTM**

The American Society for Testing Materials has announced the publication of its 1957 ASTM Proceedings, Vol. 57. The 1,430-page volume, recording the technical accomplishments of the year, include reports and papers together with discussion offered to the society during the year and accepted for the Proceedings. The volume includes the Summary of Proceedings of the ASTM 60th annual meeting, and the Summary of Proceedings of the Philadelphia spring meeting listing by title and author the programs for each section.

Copies of the Proceedings may be obtained from the American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa., for \$12.00.

### **NEMA Announces Addition of Seven Member Companies**

Seven more companies have joined the National Electrical Manufacturers' Association, as NEMA's general membership, as well as its representation in such industry product categories as appliances, industrial apparatus, and insulated wire and cable, continues to grow. The member companies, their product section affiliation, and those

### **Kelvinator Launches "Rambler Rampage" Promotion**



Counting the bushel baskets of food (total of 11) that go into a new Kelvinator refrigerator are Sol Polk, president of Chicago's Polk Brothers, and E. B. Barnes, Kelvinator general sales manager. They discuss plans for Polk's giant traffic-building promotion which runs from June 20 to August 15, in which the Kelvinator refrigerator is spotlighted. The eight-week "Rambler Rampage" at all Polk stores features a weekly drawing in which a Rambler station wagon is given away.



designated as their voting representatives, as announced by Joseph F. Miller, NEMA's managing director, are as follows: Coolerator Div., McGraw-Edison Co., Albion, Mich., *Room Air-Conditioner Section*, M. F. Beisber, president; Crescent Insulated Wire & Cable Co., Trenton, N. J., *Armored Cable Section*, Holt A. Murray, vice president and secretary; Fedders-Quigan Corp., Maspeth, L. I., N. Y., *Room Air-Conditioner Section*, *Major Appliance Div.*, *Dehumidifier Section*, U. V. Muscio, executive vice president; Kahn and Co., Inc., Hartford, Conn., *Adsorption Section*, Edwin M. Canner, chief liaison engineer; The Long Co., Oak Hill, W. Va., *Mining Belt Conveyor Section*, John B. Long, president; Thermac Co., Corona, Calif., *Automatic Temperature Controls Section*, I. E. McKinley, president; and West Bend Aluminum Co., West Bend, Wis., *Electric Housewares Section*, E. A. Kraemer, senior vice president-sales.

### Whirlpool Doubles Output of 17 Cubic Foot Refrigerator

Production of Whirlpool Corp.'s no-frost 17 cubic foot refrigerator-freezer, the M-17B, introduced only last January, will be doubled immediately, the company announced.

In a telegram to distributors, refrigerator sales manager Chester Worthington said, in part, "The modular M-17B has met with such outstanding reception by dealers, builders and the public that production schedules have been doubled. To make this the spearhead of the RCA Whirlpool refrigerator line a new list of \$699.95 has been established. Quantities will be limited until September."

### New Fabricating Plant for Tennessee Valley

Metals Engineering Corp., a new million dollar corporation for the production of metal stampings, has been announced for Greeneville, Tenn.

Modern equipment for the production of metal stampings, plating, die shop work and die castings has been purchased.

From sheet and roll metal stock, the new company will turn out finished plated metal parts from small brackets and toys to large metal chassis for TV sets. The plant will initially cover 50,000 square feet, with an additional 50,000 square feet available and under roof for future expansion.

Designed to serve the furniture, electronics, and missile industries in the southeastern part of the United States, the plant is located in the same city

where the Magnavox Corp. produces most of their products.

Robert C. Austin, president, and A. D. Wright, general manager of the engineering department, made the formal announcement in conjunction with the Tennessee Agricultural and Industrial Commission and the Greeneville, Tenn. Chamber of Commerce.

Operations will get underway about September 1, with approximately fifty employees.

There will be six departments initially, including steel stores, punch press, drill press, plating, die casting, and tool and die departments. A metal casting department for the production of all types of cast metal parts will be added within a few months, Wright said.

Wright has served for the past eleven years as tool engineer with Monroe Calculating Machine Co. E. C. Greenwood, production manager, is a native of Pennsylvania, has been personnel manager of the Austin Co. for ten years, and production manager of Southern Packaging Co. for the past five years.

Officers of the new company, in addition to Austin, are John M. Jones, vice president, Wylie Milligan, treasurer, and N. R. Coleman, Jr., secretary.

### Aluminum Extrusion Company Purchases West Coast Facility

Michael Flynn Mfg. Co., Philadelphia, manufacturer of Flynn aluminum extrusions and Lupton windows, has purchased the extrusion equipment of the Western Extrusion Co., Gardena, Calif., as part of a long range plan to manufacture aluminum extrusions, windows, and curtain wall on the West Coast, a recent report states.

The company will operate these newly-acquired facilities in their present location, pending completion of a new Flynn plant in Industry, Calif. Sales and executive offices will remain at 672 S. Lafayette Park Place, Los Angeles.

### Allis-Chalmers Executive Named Head of NEMA

J. L. Singleton, vice president, industries group, Allis-Chalmers Mfg. Co., Milwaukee, Wis., was elected president of the National Electrical Manufacturers' Association to fill the unexpired term of the late W. V. O'Brien. Singleton has been a member of the NEMA board since 1952, and served as an association vice president since 1955. The association will elect its 1959 officers at the annual convention at Atlantic City in November.

(More news on Page 56)



## COMING FEATURES

### DESIGN

ENGINEERING A NEW HOME  
LAUNDRY UNIT  
NOISE CONTROL OF DOMESTIC  
APPLIANCES

### FABRICATION

STAINLESS STEEL PROCESSING FLAWLESS  
JOB AT KRUEGER

### FINISHING

● SPECIAL FEATURE—PORCELAIN ENAMEL  
ON ALUMINUM COMES OF AGE  
RHEEM-CANADA WATER HEATER PLANT  
NEW FINISHING SYSTEM BOOSTS  
PRODUCTION CAPACITY 300%

### GENERAL

BUSINESS AND STATISTICAL RESUMÉ OF  
HOME LAUNDRY INDUSTRY PROGRESS  
TRENDS WORTH WATCHING IN THE  
HOME LAUNDRY INDUSTRY

### New Design and Styling Service

Nels A. Miller, formerly with J. P. Seeburg Corp. and Zenith Radio Corp., has announced product research, design, and styling service to industry. The address is 946 Pleasant St., Oak Park, Ill. Miller is a member of the American Institute of Management (Assoc.), American Ordnance Association, Institute of Contemporary Art, and Society of Plastics Engineers.

### Portable tools catalog

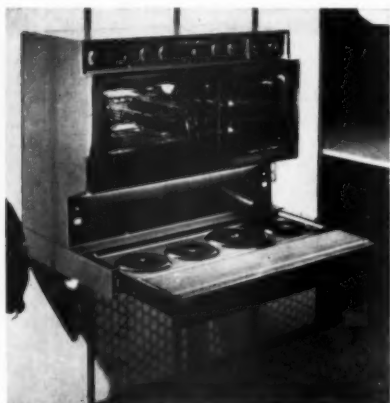
A new 1958 industrial tool catalog, with illustrations and specifications for a broad line of portable electric and air tools, has been released.

The convenient, pocket-size (5 by 6½-inch) catalog contains 47 pages listing portable power tools, including balancers, belt sanders, bench grinders, drills, generators, grinders, hammers, impact wrenches, nibblers, nut setters, polishers, sanders, saws, scalers, screwdrivers, tappers, tuck point grinders, valve seat grinders, and valve refacers.

For your copy write Readers Service Dept., METAL PRODUCTS MANUFACTURING, York St. at Park Ave., Elmhurst, Ill.

### Tappan Range One of Exhibits at 1958 Brussels World's Fair

The Tappan 400 range, designed by Smith, Scherr & McDermott, Akron, Ohio, will be exhibited at the 1958 Brussels World's Fair as an example of outstanding American industrial design. The 40-inch free standing range can be adjusted to fit the height of any individual, and can be hung on the wall or mounted on standard or custom-base cabinets. The functional and jewel-like control panel is out of reach of children, yet conveniently placed at eye level for adults. The four burners, which are concealed when not in use, have been placed in line to end reaching over hot burners. The wooden cutting board provides a handy work space, and at the same time functions as a unique safety feature; when hinged in the work position, it keeps small children away from the burners behind.



### New Secretary of ASM

Adolph O. Schaefer, President, Penney Steel and Forge Corporation, Philadelphia, has accepted appointment by the Board of Trustees of the American Society for Metals to the unexpired term of secretary of the Society following the recent death of founder-member William H. Eisenman, who for forty years had served as national secretary.

### New Insulating Material for Refrigerators

Frigidaire engineers have developed a new insulating material which may ultimately revolutionize the size, shape and construction of household refrigerators, it was announced.

Approximately one and one-quarter inch thickness of the new material is equal to three inches of conventional insulation, making it possible to increase the usable interior of a refrigerator by as much as 50 percent without enlarging the exterior, according to

H. F. Lehman, GM vice president and head of Frigidaire division.

He revealed that the new insulation actually is being used commercially by Frigidaire today around the freezer section of the Frost-Proof refrigerator-freezer combination the firm put into production several months ago. This new model, employing a new refrigeration system, never needs defrosting because no frost ever forms, not even in the freezer.

R. E. Gould, Frigidaire's chief engineer, explained that a small quantity of the material, a combination of Freon and Urethane, can be poured between the walls of a refrigerator. Within moments the material foams and "rises like dough" to fill the entire space, and then becomes rigid, adhering perfectly to all surfaces. The rigid foam thus becomes a strong, integral part of the structure. "Not only does this new insulation seem certain to improve refrigerators and freezers as we know them today, but it will ultimately change their design and appearance altogether, and open unlimited possibilities for other refrigerated products for home and industry," Gould said.

### Sales Upswing for Lewyt

The Lewyt Corporation reported that sales for its vacuum cleaners for the month of May soared to a three-year high, averaging an increase of 36 percent. Figures for June, while not yet complete, indicate that the Lewyt cleaner enjoyed better sales last month than for the same period in 1957.

### Metallurgists Get Top Salary Among Lehigh Seniors

Metallurgists recently graduated from Lehigh University command top salary offers. That was the report of Everett A. Teal, director of placement and counselling services at Lehigh, when he presented an analysis of job placement of the class graduated in June.

The average starting salary for metallurgical engineers is \$486 a month compared to \$460 in 1957.

### Furnace Orders Reflect Dearth of Investment

Net new orders for industrial furnaces in May, 1958 totaled only \$953,000, a new eight-year low, and 81 percent under the May, 1957 figure of \$4,994,000. The dearth of new business in this essential heavy goods industry reflects the negligible amount of new capital investment and modernization taking place at this time.

### INDUSTRY PERSONALS

The Maytag Co., Newton, Iowa, has announced that **Ned Sackett** and **Donald Smith** have recently joined the company as trainees in the firm's engineering and manufacturing training program.

**Larry Harlan** and **Paul Herder** have also joined the firm in the engineering division.

Election of **Emerson S. Ronk**, vice president of Rheem Mfg. Co., as a director of Rheem Peruana S. A., Lima, Peru, has been announced by A. Lightfoot Walker, president of both companies, at Rheem headquarters in New York.

**Harvey G. Knuth** has been appointed manager of the new product research department of Lyon Metal Products, Aurora, Ill., with headquarters in Aurora. Knuth will handle all phases of searching for new product additions, and wherever necessary to diversify and acquire new products, the possible acquisition of new companies.

**George W. Allen** has been appointed director of engineering of the Herrin, Ill. home laundry plant, V. C. Rice, vice president of all manufacturing and engineering for the Norge division of Borg-Warner Corp., Chicago, has announced.

**Stanley G. Fisher**, vice president and general sales manager, Landers, Frary & Clark, New Britain, Conn., and **Walter N. Maguire**, Maguire & Cole, Stamford, have been elected directors of Landers, according to an announcement.

**William H. Chase** has been appointed merchandising coordinator for the Norge division of Borg-Warner Corp., Chicago.

**Wendell H. Carr** has been elected treasurer of Chambers Built-Ins, Inc., according to Fred Flato, president.

The appointment of **Howard Ballard** as sales promotion manager for kitchen appliances was announced recently by Gordon C. Hurt, director of advertising and merchandising for the Norge division of Borg-Warner Corp., Chicago. Ballard will create and follow promotions on Norge gas and electric ranges, refrigerators, and home freezers.

# Chemical Prepaint Treatments for Metal Surfaces

What they do, the types available, how they are applied



By J. H. GEYER  
Manager, Product  
Development Dept.,  
AMCHEM  
PRODUCTS, INC.

Paint systems have been steadily improved in an effort to produce more decorative, easier-to-apply, and more corrosion-resistant films. The ability, however, of any paint film to perform its predetermined functions cannot be fully utilized without properly preparing the metal surface.

The prepaint preparation of the metal surface is therefore a highly important part of the system. Chemical prepaint treatments are designed to do four jobs and do them well. First, they remove organic soils, shop dirt, scale, and rust or corrosion products from the metal surface. Second, they provide surfaces that are completely compatible with subsequent paint films. Third, they produce a *tooth* that promotes good paint film adhesion. Fourth, they effectively prevent underpaint corrosion growth after any breakthrough in the paint film.

Basically, there are four types of chemical prepaint treatments. These are phosphoric acid, iron phosphate, zinc phosphate, and amorphous phosphate or chromate. Each is discussed briefly in the following paragraphs.



## Phosphoric Acid

Perhaps the most widely used and certainly one of the most economical chemical prepaint treatments is the phosphoric acid cleaner combination materials. ACP Deoxidine® is such a material. It removes organic soils, rust, scale and contaminating elements from the metal surface. It also produces a light etch on steel, aluminum or zinc surfaces which considerably aids in increasing paint adhesion. It does not, however, form an actual coating on the metal surface. Any breakthrough in the subsequent paint film will permit

underfilm corrosion to proceed. Grades of Deoxidine are available for application by brush or swab, hot and cold dip, or hot spray.



## Iron Phosphate

Iron phosphating processes are extensively used in the chemical prepaint treatment of appliances such as water heater shells, ranges, washers, dryers and other *white lines*. These processes will produce excellent paint-bonding films on the metal and retard or prevent underpaint corrosion. Duridine®, ACP's iron phosphating process, is a combination organic soil cleaner and iron phosphate coating material. Both the cleaning and coating operations take place in the same bath. Duridine and other iron phosphates do not lend themselves to brush-on application, are primarily designed for spray type equipment of four or five stages. But several dip installations are successfully operating today by inclusion of an alkali precleaning stage.



## Zinc Phosphate

ACP Granodine® is an example of this type of chemical prepaint treatment process, the type now being used to treat steel in the automotive industry, and predominantly specified for steel ordnance and military items. This process forms a coating which offers the ultimate in paint adhesion promotion and vastly augments the corrosion resistance of subsequent paint films. Zinc phosphate materials are extremely flexible as to method of application—can be applied by brush, dip or automatic spray equipment. In a typical dip or power spray system, the stages would be alkali clean, water rinse, zinc phosphate treatment, water rinse, and acidulated final rinse. If the metal has considerable areas of rust or scale, an acid pickle is advisable following the alkali cleaning stage.

On zinc surfaces, the zinc phosphates perform a rather unique function. They act as a barrier against chemical reaction between the applied paint film and the zinc surface. This effectively prevents blistering of the

paint and early breakdown of the film. This is in addition, of course, to the improvement of paint adhesion and the retarding of underpaint corrosion. ACP Lithoform® is specially designed for use over zinc surfaces and finds wide application as a prepaint treatment for ornamental zinc die castings, refrigerator liners, and on most galvanized work requiring painted finishes.



## Amorphous Phosphate and Chromate

These coatings are the films produced by the ACP Alodine processes and similar ones on aluminum surfaces. They have met with wide acceptance in the prepaint treatment of venetian blind strips, refrigerator liners, aluminum heat transfer units, aircraft sheet metal assemblies, and many other items fabricated from aluminum. The various coatings provide an excellent film for the promotion of paint adhesion and effectively prevent underfilm corrosion. As in the case of zinc, aluminum exhibits a tendency to chemically react with some paint systems. The Alodine processes develop a barrier film between the paint and the aluminum surfaces which prevents this reaction. The Alodines are extremely versatile materials that can be applied to aluminum surfaces by brush, hand spray, dipping, mechanical spraying, or roller coating equipment. Brush application is particularly well adapted to the processing of parts too large for simple dip systems or in manufacturing operations that do not warrant a tank setup. In dip, spray or roller coating application, the system usually consists of an alkaline preclean, a water rinse, the Alodine treatment, a water rinse, and an acidulated final rinse. Where the surface is heavily oxidized, a de-oxidizer in the line is needed.

*The major chemical prepaint treatments for metals have been covered briefly in this article. More complete information can be had by contacting an ACP sales representative or by writing us at Ambler, Pa.*

## Amchem Products, Inc. Ambler 33, Pa.

Formerly  
**CHEMICALS**  
**ACP**  
**PROCESSES**  
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**MAKE OF WIRE**  
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**ECONOMICAL**



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2702 FERRY STREET • LAFAYETTE, INDIANA

*Peerless Products Please*  
ESTABLISHED 1910

## Family products service— a \$16 billion business— and growing

the service man "on the street"  
costs 60% more than ten years ago

by *Robert J. Geran* • KELVINATOR DIV.,  
AM. MOTORS CORP.

SERVICE ON PRODUCTS used by the American family, including appliances and automobiles, is a \$16 billion a year business now and is growing at a rate that will push it over \$30 billion by 1957.

The obvious factors behind the tremendous growth in the service business are increasing consumption of products requiring service, increasing mechanical complexity of familiar products, and increasing costs.

There is a difference between the service the customer expects to get from the product, and necessary service that must be performed to keep the product operating properly. Product performance is the real "hidden persuader" in appliance merchandising.

More major appliance sales result from a customer's own happy experience with a product, or from a friend or relative's experience than from any other single factor.

The service organizations that must keep the customer happy with the products in his home are confronted with a number of current problems that have nothing to do with the mechanical operation of the product.

These include overselling the customer as to what the product can do, careless delivery and installation, unwillingness to admit that a product might require future service, shortage of skilled field servicemen, higher costs, and "cut-price" merchandising.

With cut-price selling, it is impossible for a retail service organization to set up the reserves that are needed to operate a department and give a customer the proper kind of service. Service takes money, and the industry cannot provide it, nor can the customer get it, unless it is paid for.

It costs \$6.02 an hour currently in a typical large U. S. city just to keep a service man on the street. This includes basic wages and fringes, truck operating costs and some overhead, with no allowance for special expenses or profits.

Ten years ago these costs were \$3.77 an hour, and there were more dollars in the sale.

To reduce costs, greater attention should be given to designing and styling the product with service in mind, thorough user instruction at the time of installation, reduction in the number of models in a product line, and greater standardization of parts.

### EDITOR'S NOTE:

This brief statement by Mr. Geran was adapted for MPM from an address before the domestic refrigerator engineering conference at the 54th annual meeting of the American Society of Refrigerating Engineers, at Minneapolis. It represents one of a series of editorials, guest editorials, and editorial features on the subject of appliance and metal product service.

## SUPPLIER PERSONALS

After 22 years with Dun & Bradstreet, **Albert H. Damon** has accepted an appointment as vice president in charge of sales with Edgcomb Steel of New England, Inc., according to an announcement by Arthur W. Moody, president of the metals distributing company.

**Dr. Clarence Bremer**, formerly director of research, has been appointed technical director of Oakite Products, Inc., New York.

**William J. Hennessy** has been appointed National Product Development Manager for Kelite Corporation, manufacturer of industrial chemicals for cleaning and metal finishing, and steam cleaning equipment.

Directors of Fairmont Aluminum Company, wholly owned subsidiary of Cerro de Pasco Corporation, have elected **Harley T. Pyles** and **W. Bradley Blair** to the posts, respectively, of vice president and treasurer and vice president-sales, it was announced today by Robert P. Koenig, president of Cerro and board chairman of Fairmont. Blair's association with Fairmont dates from 1943, when he joined the company as a metallurgist. He was formerly assistant sales manager, manager of Fairmont's Chicago sales office, and director of sales.

Pemco Corp., Baltimore, Md., has announced the transfer of two sales engineers.

**Theodore Buit** is moving from the Western Michigan area into a territory that includes Pennsylvania and Eastern Ohio. He was a Pemco field engineer for many years before taking over the sales work in Michigan and Illinois.

**George Haskell Smith**, who was formerly in the Penn-Ohio territory, is being transferred to the home office for a special assignment.

**William A. Baltzell**, formerly assistant sales manager, has been appointed industrial sales manager for Oakite Products, Inc., now in its 50th year as manufacturers of industrial cleaning and metal treating materials. He will be responsible for the work of the company's seventeen divisions and two hundred and forty technical service representatives throughout the U. S. and Canada.

Controls Co. of America recently announced the promotion of **Jack Shnable** as its West Coast general sales manager. In his position as sales manager, effective July 15th, he will be responsible for directing the selling efforts of all products manufactured by Controls Co. and its affiliates. He will be located at the Controls Co., 139 Illinois St., El Segundo, Calif.

Three key appointments in the management of Minneapolis-Honeywell's Boston division have been announced by George J. Schwartz, vice president and general manager.

**C. B. Harrison** has been named to the newly-created position of marketing manager, **J. A. Vitka** has been appointed contract administration manager, and **W. A. Rote** is now director of engineering.

**Robert R. Pierce** has been named manager of the corrosion engineering products department of Pennsalt Chemicals Corp., according to Hugh C. Land, general manager of the industrial division. Pierce will be in charge of manufacturing, sales, and development for the company's line of corrosion resistant mortars, protective coatings, plastic toppings, and plastics for the fabrication of process equipment used to handle corrosives. He will have headquarters in Natrona, Pa., where all activities for this department will be centered, starting in September.

**Louis G. Terminiello** has been named new projects chemical representative at Vitro's West Orange laboratory, according to an announcement by Dr. William A. Bain, vice president of Vitro laboratories, and director of the West Orange laboratory. Before joining Vitro, Terminiello served as technical sales representative for the adhesives division of the National Starch Products Corp., Plainfield, N. J., and sales representative of the silicon division of Union Carbide & Carbon Corp.

Inland Steel Co. recently announced two promotions in its Commercial Research division. **William E. Rothfelder** was promoted to manager from assistant manager, and **Morris Caminer**, who had been serving as a market analyst, was promoted to assistant manager.

**Frank W. Weldon** has been appointed district sales manager for Kelite Corp., manufacturer of industrial chemicals for cleaning and metal finishing, and steam cleaning equipment. William Sorensen, Kelite's marketing director, made the announcement.

A newly-created position at Armco Steel Corporation's Baltimore works, that of supervisor of union relations, has been assigned to **Reed D. O'Connell**. The announcement was made by C. C. McElvain, works manager.

**Paul J. Breting**, purchasing agent of Rheem Automotive Co., Fullerton, Calif., has announced his retirement for September 1, according to news released recently by O. Wayne Carrico, vice president and general manager. Carrico added that Breting is being retained by the company in a consulting capacity.

**Paul J. Fountain**, whose appointment as assistant manager of stainless sales for the Boston plant of Joseph T. Ryerson & Son, Inc., was announced early this year, has been named manager of stainless steel sales. He replaces **Philip B. Van Horne**, who becomes consultant, stainless sales.

BREMER



HENNESSY



PYLES



BLAIR



SMITH



BUIT



# NEWS about Suppliers

## H-VW-M Doubles Research and Development Program

Hanson-Van Winkle-Munning Co., Matawan, N. J., announced recently that it has more than doubled its investment in research and development during the current recession. Several key personnel have been added in connection with the continuing expansion program, and the company announced that further staff additions were imminent. Included in the program are complete reorganization of the engineering staff, which is now nearing completion, expansion of the firm's electrochemical laboratory, and the building and staffing of electrical and mechanical laboratories.

## Narda Distribution Worldwide

The Narda Ultrasonics Corp., Westbury, L. I., N. Y., with annual sales approaching 1½ million dollars, has completed organization of a large national and worldwide distribution and sales program, according to Paul M. Platzman, vice president in charge of sales.

Distributors have been appointed in 48 states and many foreign countries to handle the Narda Sonblaster line of ultrasonic processing systems. Through distributors, the firm has developed an aggregate sales force of more than 800 technical sales and service specialists.

## New Name for Hooker

Hooker Chemical Corp. is the new name adopted by Hooker Electrochemical Co., Niagara Falls, N. Y. The firm manufactures sodium chlorate.

## Missile Tubes now Chemically Milled

Extruded tubes used in the U. S. Army-designed IRBM Jupiter C missile are now being chemically milled on a production basis. (See "Milling with chemicals," Page 46, June, 1957 MPM.)

Anadite, Inc., South Gate, Calif., subcontractor on the tubes, states that the chemical milling of these tubes has eliminated a sizable amount of weight which has increased the overall range of the Jupiter C. The tube, approximately 16 feet long, and weighing 51 pounds before milling, is reduced in weight to 18 pounds by the process.

## Danly Appoints Distributor

Machine Tool Sales Co., division of Tool Supply & Engineering Co., 520 Park Ave., Dallas, Texas, has been appointed the distributor for Danly presses in the East, North, Central, and West Texas areas, according to officials of Danly Machine Specialties, Inc., Chicago.

The firm will handle the complete line of Danly presses, including open back inclinable, auto-feed, straight side, double and single action, and double and triple underdrive presses.

## Ferro Continues Expansion Program

A one-half million dollar expansion program to provide increased facilities for two Ferro Corp. operations was announced recently by Robert A. Weaver,

chairman. Scheduled for expansion are the firm's Brazilian subsidiary, Ferro Enamel S. A., Sao Paulo, Brazil, and the Ferro Fiber Glass division located in Nashville, Tenn.

The Nashville plant completed a one and one-half million dollar expansion program late last year. Ferro Enamel (Brazil) manufactures porcelain enamel and glaze frit, color oxides for the ceramic and plastic industries, and other products.

## Automatic Switch Appoints Distributor

Automatic Switch Co., Florham Park, N. J., has announced the appointment of Mott Bros. Co., 907 S. Main St., Rockford, Ill. as authorized stocking distributors of Asco solenoid valves.

## Gries Reproducer Expands Sales Territory

An expansion in the sales territory of Harry F. Davis and Sons, Gries Reproducer Corporation's sales representatives in Northern Ohio and Western Pennsylvania, has been announced by

## Kelite Conference Held

Kelite Corp., manufacturer of industrial chemicals for cleaning and metal finishing, and steam cleaning equipment, held its semi-annual conference of all Eastern Region sales personnel re-

cently at its Berkeley Heights, N. J. facility. The theme of the conference was effective selling through utilization of Kelite's marketing strengths. William Sorensen, marketing director, presided.



*Kelite Corporation's management personnel and Eastern Region sales engineers who attended a recent sales conference at the firm's Berkeley Heights, N. J. facility are: (front row, l. to r.) C. L. Rust, J. J. Trexler, P. J. Stroh, G. R. Slicker, J. Emala, S. F. Silvestro, W. E. Wilgan, R. L. Bradley, J. H. Sweigart, H. P. O'Horo, J. A. Von Pless, J. S. Vanos, D. A. Foley, G. Penndorf, and J. E. O'Brien. (back row, l. to r.) C. N. Chalfant, F. Kelly, J. B. Palien, M. Petrusiak, S. Perez, J. G. Schirtzinger, H. J. Bystricky, E. D. Schunke, L. C. Sorensen, W. Sorensen, L. McDonald, A. Damalak, C. R. McClune, W. J. Hennessy, C. W. Gilmore, G. K. Boucher, and A. E. Sakavich.*



Joseph Saks, director of sales, GRC. Davis and Sons' territory will now include the northwest counties of West Virginia. The Davis firm is located at 3262 Warrington Rd., Shaker Heights, (Cleveland) Ohio. GRC's stock components include the entire die cast zinc alloy and molded nylon fasteners line, as well as appliance, electrical, and electronic parts.

### Ultra-modern Hommel Research Center Nears Completion

The O. Hommel Co. has announced that its new ultra-modern research center located directly across from the main offices in Carnegie, Pa., is nearing completion. The new building is reported to contain many modern innovations, and will add over 20,000 square feet of research facilities for ceramic research and development.

According to a report from Ernest Hommel, president of the O. Hommel Co., the new center will contain an air-conditioned, dust-free, constant-temperature instrument room. In addition to facilities for research in connection with porcelain enamel and other ceramic materials, special provision has been made for both static and dynamic testing of high temperature ceramic coatings.

Architectural porcelain enamel was used extensively both for exterior and interior applications.

Among the projects to be continued and undertaken in the new research center are; the development of better porcelain enamel finishes for household appliances, improvement of high temperature ceramic for aircraft and missiles, and research work in area lighting in conjunction with major electrical companies, the report states.

### J&L Merges Stainless and Strip Divisions

Jones & Laughlin Steel Corp. has initiated the merger of its stainless steel and strip steel divisions, it was announced recently by M. K. Schnurr, president of the two divisions. The new division will be known as the Jones & Laughlin stainless and strip division.

The merger is designed to weld into a single production and marketing unit the specialty divisions of the company, the report states. The stainless steel division was formerly the Rotary Electric Steel Co., and the strip steel division was the former Cold Metal Products Co. of Youngstown and Indianapolis.

The first step in the merger, Schnurr said, is the combining of the sales forces

of the two divisions and a merging of the district sales offices.

John H. Abbott, formerly vice president-sales for the stainless division, has been appointed to the same post for the combined division. J. T. Bachman, formerly in charge of sales for the strip steel division, has been appointed general manager of the former strip division operation. H. N. Steinberger, formerly general manager of sales for the stainless steel division, has been appointed general sales manager for the combined division.

Current plans call for the combined operation of six district sales offices, Schnurr added. These include Detroit, Newark, Chicago, Indianapolis, Cleveland, and Los Angeles.

### Controls Co. of America Acquires Redmond Co.



Louis Putze (center), president of the Controls Co. of America, Schiller Park, Ill., is shown announcing the acquisition of the Redmond Co., Inc., Owosso, Mich. (See presstime announcement, Page 69, July MPM.) The announcement was made to a group of Chicago business and financial leaders. At the left is Roy W. Johnson, chairman of the board of the Controls Co. At the right is James Tweedy, president of the Redmond Co., a leading manufacturer of fractional horsepower motors and specialized electrical equipment. Putze told the group that the acquisition of Redmond would enable the Controls Co. to offer a completely engineered package of controls to a wide variety of

### Pemco Sets Up Two Scholarships

Pemco Corporation has set up two scholarships to aid students in the field of ceramic engineering. This has been announced by Dr. G. H. Spencer-Strong, Vice President and Director of Research. The scholarships, one at Rutgers University and the other one at Ohio State, provide \$500 a year for a properly qualified student.

These two new scholarships are in addition to the Karl Turk Fellowship at Harvard. This grant, maintained by the Pemco Corporation, provides for a two year subsidy in the amount of \$5,000.

### Reynolds Expands Activity in Architectural Products



Edward J. Tangredi has been named director of monumental and general construction sales for Reynolds Metals Co. The appointment was announced by Alfred H. Williams, general

manager of Reynolds' architectural and building products market.

Tangredi formerly was chief engineer for Webb & Knapp, building and developmental firm in New York City, where he directed applications of aluminum in large monumental buildings, apartments, and one-family homes, attracting much interest in architectural circles.

In his new position, Tangredi will direct the development of standard aluminum curtain wall systems for commercial and industrial buildings, both one-story and multi-level, and for apartment houses. Also being developed are load-bearing one-story wall panels, clear-span roofs, interior uses of aluminum, and other building-industry applications of the light metal.

### New OEM Representative Firm Formed

Formation of the Misamore-Davis Co. is announced by Earl W. Misamore and Gerald B. Davis. The firm will specialize in the engineering and sale of original equipment manufacturer's products in the allied fields of die castings, fasteners, plastics, molded rubber, screws, springs, stampings, screw machine parts, and wire forms. The company will be located in the Center-West Building at 20950 Center Ridge Rd., Cleveland, Ohio.

Misamore was formerly vice president-sales of Cuyahoga Spring Co. Prior to this, he was sales promotion manager of Tinnerman Products Corp. Davis was formerly vice president and director of sales of the Baker-Raulang Co.

### Jake Eagle Dies

Jake Eagle, manager of color sales, Pemco Corp., died June 29. He was 59. Before his association with Pemco, he spent twelve years with Vitro Mfg. Co. During World War II, he was chief of the Non-Metal section of the War Production Board.

## Unusual treatment in stainless steel

panels, made with inexpensive dies, lend textured appearance to building

**A**N APPLICATION for new stainless steel curtain wall panels for both industrial and office buildings is demonstrated by the new West Leechburg, Pa. office building of Allegheny Ludlum Steel Corp.

The panel design in stainless steel was made with inexpensive dies using hydraulic press equipment.

The panels are four feet square, and are of 20-gauge, type 202 stainless steel

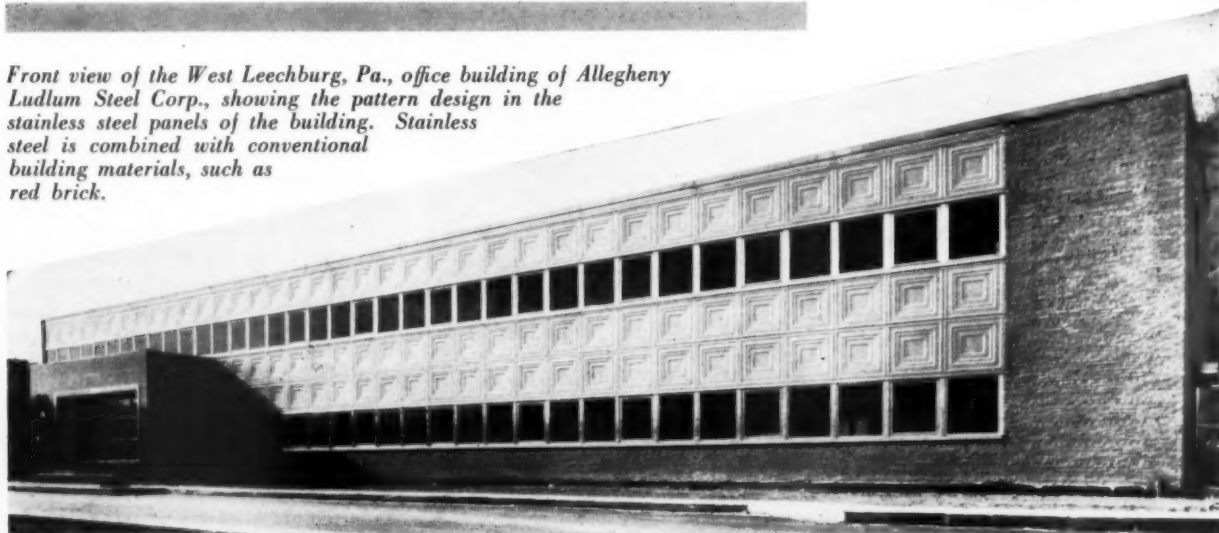
supplied by the steel firm's mills in West Leechburg and Brackenridge, Pa. In all, about 20,000 pounds of stainless steel (214 panels) were used in the building, which is of curtain wall design on a structural grid system.

Additional items of stainless steel in the building include locksets, hinges, kickplates, door pulls, doors and jambs, push plates, push bars, and a number of other miscellaneous items.



Closeup view of a workman bolting a four-foot square panel in place. The panel is of concentric squares, and is of type 202 stainless steel with a brushed finish.

Front view of the West Leechburg, Pa., office building of Allegheny Ludlum Steel Corp., showing the pattern design in the stainless steel panels of the building. Stainless steel is combined with conventional building materials, such as red brick.



### Presstime News

#### Whirlpool June Sales Up

Presstime note: Whirlpool Corp., St. Joseph, Mich., has announced that total RCA Whirlpool appliance sales to dealers in June were a thumping 22.4 per cent ahead of May. By comparison with June of last year, John A. Hurley, Whirlpool's vice president in charge of sales, said that total sales to RCA Whirlpool distributors were up 30.1 per cent over June, 1957.

**David H. McClain** has been appointed general manager of Crane Co. branches, W. O. Brown, vice president for sales, has announced. McClain has been administrative assistant for branches since January, 1957.

#### Fairmont Aluminum Appoints Rolled Steel Corporation Mid-West Distributor

Fairmont Aluminum Company, producer of aluminum sheet, coil and circles, has appointed Rolled Steel Corporation sole distributor of the company's products in a major portion of the Mid-West.

**W. Bradley Blair**, Fairmont vice president in charge of sales, said that the principal area to be served by Rolled Steel's warehouse operation extends over parts of Michigan, Indiana, Illinois and Wisconsin. The new distributor will maintain a complete stock of Fairmont products for immediate shipment.

Rolled Steel Corporation's principal office and main warehouse facility are located at 3250 West Touhy Avenue, Skokie, Illinois. (See "selling steel by telephone" P. 28 July 1957 MPM).

The Alloy Tube division of The Carpenter Steel Co., Union, N. J., has promoted **Nicholas Chernik** to assistant chief metallurgist.

Two new supervisory appointments at Armco Steel Corporation's Baltimore Works have been announced by C. C. McElvain, works manager.

**Fred A. Emm** will become assistant to the manager, and **A. Olin Grimes** has been appointed general superintendent of the stainless steel plant.

EMM



GRIMES



# safe transit

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York Street at Park Avenue  
Elmhurst, Illinois

## editorial voice of the national safe transit program

devoted to improving packaging methods and shipping and materials handling methods for the appliance and metal products manufacturing industries. This section contains plant experience information and industry advances for the use of all executives and plant men interested in improving packaging and shipping methods and in loss prevention. The section contains complete information on the national safe transit pre-shipment testing program for packaged finished products and detailed reports of divisions and sub-committees of the National Safe Transit Committee.

### Morrell Announces Representatives

The John Morrell Mfg. Co., Elgin, Ill., announces the appointment of the following manufacturers' representatives, and their territories, for the company's line of standard and specialized lift trucks and materials handling equipment: John P. Harrington & Associates, 15336 W. Warren Ave., Dearborn, Mich., Michigan and Ohio; Storage Equipment, P. O. Box 1384, Opa-Locka, Fla., Southern Florida; Hooper-Green Co., 407 S. Dearborn St., Chicago 5, Ill., Eastern Iowa and Northern Illinois and Indiana; Technical Product Co., 369 Lexington Ave., New York 17, N. Y., Metropolitan New York City; and Pirie Industrial Products Co., P. O. Box 244, Jenkintown, Pa., Eastern Pennsylvania, Southern New Jersey, and Delaware.

### New Program Stresses Carrier-Manufacturer Cooperation

In an effort to lend broader emphasis to the National Safe Transit Program the NST Committee has just completed work on a three step procedure whereby the individual carrier may initiate action which will result in increased participation in the program. This carrier program was previewed by the trucking industry representatives at the ATA, National Freight Claim Council Annual Meeting in Denver, Colorado on June 19, 1958, where it was received with enthusiastic approval.

The program in brief:

For every carrier customer who consistently files claims on products of a repetitive or assembly line nature, one of the following approaches may well be the answer to his problem.

1. Refer your customer's name and address to the National Safe Transit Committee, giving a brief description of the product(s) he manufactures. NST will contact your customer, keeping your name in confidence should you so desire.

2. Refer your customer's name to any one of the many NST certified testing or container laboratories. The laboratory will be happy to assist you by having one of their representatives call on your customer.

3. Approach your customer through your own sales organization, using a frank offer of joint cooperation for Safe Transit as a mutually rewarding way of increasing profits.

### NWBA Offers Revised Industrial Box Specification

The National Wooden Box Association announces the availability of the revised specification for Nailed Wooden and Lock Corner Boxes for Industrial Use, NWBA Specification I-1B of May, 1958. To meet demands from industry for a national standard, the original specification, I-1A, issued in May, 1956, received wide distribution and usage.

Changes in the revised specification, determined by the industry's Specifications Committee, reflect current requirements and practices for both box users and manufacturers. Industrial wooden box users, particularly those holding copies of Specification I-1A, are urged to obtain copies of the revision. Copies can be obtained from your box manufacturer or by contacting National Wooden Box Association, Barr Building, Washington 6, D. C.

### NST Imprinted Label

The National Safe Transit Committee has made available to its more than 285 certified manufacturers the new imprinted label below. (See June MPM, Page 86, for trial run conducted at Fedders-Quigan air conditioning plants.)

Checking the first imprinted Fedders-Quigan unit to be shipped are, l. to r., Melvin E. Melloch, packaging engineer, Salvatore Giordano, president, and Nicholas Sabine, assistant director of purchasing.



The eye-catching symbolism of the Safe Transit imprint tells a story without words. Repetition of the hands represents a twofold guarantee of a packaged product tested and proved, inside and out; a sound product and package.





## NST Certified Laboratories

Atlas Plywood Corporation  
P.O. Box 989  
Lawrence, Massachusetts

Bathurst Power & Paper Co., Ltd.  
1000 Gerrard Street, E.  
Toronto, Ontario, Canada

Bathurst Power & Paper Company, Limited  
1035 Hodge Street  
St. Laurent, Quebec, Canada

Bigelow-Garvey Lumber Company  
325 West Huron Street  
Chicago 10, Illinois

Canton Corrugated Box Company  
2820 Winfield Way, N.E.  
Canton 5, Ohio

Chicago Mill and Lumber Company  
2660 Clybourn Ave.  
Chicago 14, Illinois

Container Corporation of America  
Central Laboratory  
10 North Clark Street  
Chicago 2, Illinois

Container Laboratories, Inc.  
112 West Kinzie Street  
Chicago 10, Illinois

Container Corporation of America  
California Container Corp. Div.  
2601 South Malt Avenue  
Los Angeles 22, California

Container Laboratories, Inc.  
435 Stanford Ave.  
Los Angeles 13, California

Container Laboratories, Inc.  
151 New Montgomery St.  
San Francisco 5, California

Container Laboratories, Inc.  
45 East 22nd Street  
New York 10, New York

Container Laboratories, Inc.  
Philadelphia Branch  
Terwood Road, Willow Road  
Willow Grove, Penna.

The Continental Can Co., Inc.  
Robert Gair Paper Products Group  
911 Hiawatha Blvd., East  
Syracuse 9, New York

Cornell Paperboard Products Company  
1514 E. Thomas Avenue  
Milwaukee 1, Wisconsin

The Corrugated Container Company  
640 Shoemaker Avenue  
Columbus 3, Ohio

Cozier Container Corp.  
446 East 131st Street  
Cleveland 8, Ohio

Dura-Crates, Inc.  
940 E. Michigan Street  
Indianapolis 2, Indiana

Flintkote Company  
Container Division  
5500 S. Alameda Street  
Los Angeles 54, California

Fort Wayne Corrugated Paper Company  
130 East Douglas Avenue  
Fort Wayne, Indiana

Gair Company Canada Limited  
111 Richmond Street, W.  
Toronto, Ontario, Canada

Gaylord Container Corporation  
Division of Crown Zellerbach Corporation  
143 Arsenal Street  
St. Louis 18, Missouri

Gaynes Engineering Company  
1642 West Fulton Street  
Chicago 12, Illinois

General Box Company  
1825 Miner Street  
Des Plaines, Illinois

Green Bay Box Company  
Green Bay, Wisconsin

Highland Box Company  
Highland, Illinois

The Hinde & Dauch Paper Co.  
Sandusky, Ohio

Hinde & Dauch Paper Co. of Canada, Limited  
43 Hanna Avenue  
Toronto 3, Ontario, Canada

Hoerner Boxes, Inc.  
Main Street Road  
Keokuk, Iowa

Hygrade Containers Limited  
1170 Martin Grove Road  
Toronto, Ontario, Canada

Hygrade Containers Limited  
575 Pall Mall Street  
London, Ontario, Canada

Indianapolis Wire Bound Box Co.  
Fernwood, Mississippi

Inland Container Corporation  
700 W. Morris Street  
Indianapolis 6, Indiana

Institute of Packaging  
Southern Methodist University  
Dallas, Texas

International Paper Co.  
Container Division  
5133 West 65th Street  
Chicago 38, Illinois

International Paper Co.  
6150 Sheila Street  
Los Angeles, California

International Paper Company  
Container Division  
21st Street & Kansas Avenue  
Kansas City 3, Kansas

International Paper Co.  
Container Division  
7901 Michigan Ave.  
St. Louis 11, Missouri

International Paper Co.  
Container Division  
Whippany, New Jersey

International Paper Company  
Container Division  
689 Palmer Street  
Wooster, Ohio

Container Testing Laboratory  
International Paper Co.  
Georgetown, South Carolina

L.A.B. Corporation  
Skaneateles, New York

Lawrence Paper Company  
Foot of New Hampshire Street  
Lawrence, Kansas

The Lewisburg Container Company  
Lewisburg, Ohio

Livingston Wood Manufacturing Limited  
Tillsonburg, Ontario, Canada

Love Box Company, Inc.  
P.O. Box 546  
Wichita 1, Kansas

The Mengel Company  
1111 Zane Street  
Louisville, Kentucky

The Mengel Company, Inc.  
Corrugated Box Division  
Box 189  
New Brunswick, New Jersey

The Mengel Company  
Corrugated Box Division  
P.O. Box 383  
Fulton, New York

The Mengel Company  
Corrugated Box Division  
Winston-Salem, North Carolina

T. R. Miller Mill Company, Inc.  
Brewton, Alabama

Mohawk Containers, Inc.  
Campion Road  
New Hartford, New York

The Nashville Corrugated Box Company  
P.O. Box 968  
Nashville, Tennessee

Northwestern Corrugated Box Company  
1821 Marshall Street, N.E.  
Minneapolis, Minnesota

Ohio Boxboard Company  
Rittman, Ohio

Ottawa River Paper Company  
P.O. Box 629  
G-4349 S. Dort Highway  
Flint 7, Michigan

Pembroke Shook Mills Limited  
Pembroke, Ontario, Canada

Package Research Laboratory  
Rockaway, New Jersey

Pomeroy Mfg. Co., Inc.  
Vincennes, Indiana

Don L. Quinn Company  
224 West Kinzie Street  
Chicago 10, Illinois

Rathborne, Hair & Ridgeway Box Co.  
1440 West 21st Place  
Chicago, Illinois

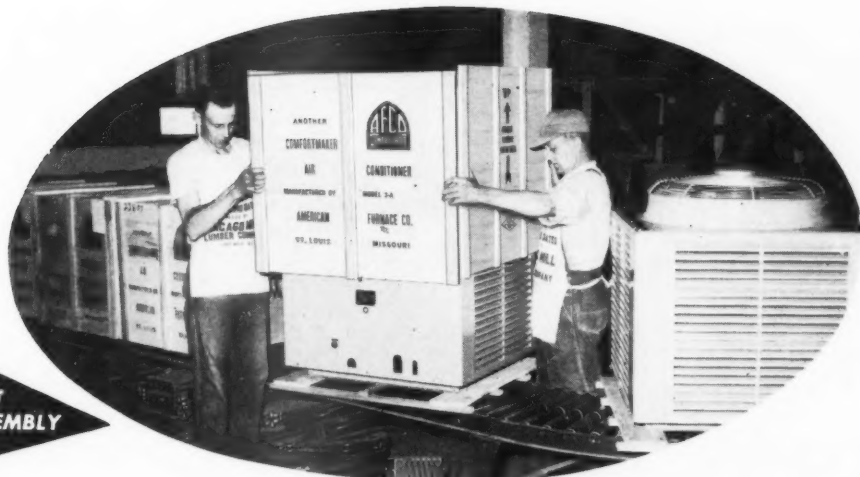
Twin Cities Container Corporation  
Coloma, Michigan

Union Bag-Camp Paper Corp.  
P.O. Box 570  
Savannah, Georgia

U.S. Testing Co., Inc.  
1415 Park Avenue  
Hoboken, New Jersey

Vanant Company, Inc.  
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PALLET BOXES—  
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Wirebound Boxes



Corrugated



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### Double-duty finishing

→ from Page 35

over from one dip color to the other is  
 required.

While each section of this tank em-  
 ploys its own power mixing, filtering,  
 and agitating facilities, the arrangement  
 leads to a very compact installation  
 when compared to two separate dip tank  
 installations. This results in a consider-  
 able saving of floor space.

Sprayed articles travel to the new 20-  
 foot water wash spray booth, where they  
 receive two coats of enamel. The ena-  
 mel is sprayed at a temperature of  
 150° F. Company reports show that  
 this hot spray method has reduced the  
 "orange peel effect" and minimized the  
 loss of paint from overspray.

Painted parts are baked in an over-  
 head oven, after which they are cooled,  
 removed from the line, and transported  
 to the assembly department.

### New Dates for 1959

#### Summer Market Scheduled

The board of governors of the Ameri-  
 can Furniture Mart, at its semi-annual  
 meeting recently, shifted the dates of the  
 1959 summer market from previously-  
 scheduled dates of June 22-July 2, to  
 July 6-16, 1959.

In a joint statement concerning the  
 shift, Board Chairman James S. Lynch,  
 B. F. Huntley Furniture Co., Winston-  
 Salem, N. C., and Secretary Frank S.  
 Whiting, senior vice president of the  
 American Furniture Mart, stated that  
 "The change in the dates of the 1959  
 summer market was made to conform to  
 today's pattern of buying and selling,  
 and to make market planning more suit-  
 able to the requirements of thousands of  
 retail stores and dealers."





**want more  
leisure time?**

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*and build sales, too!*

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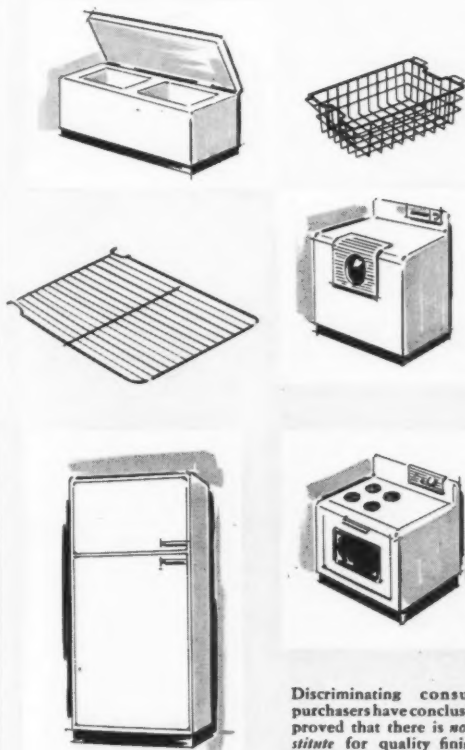
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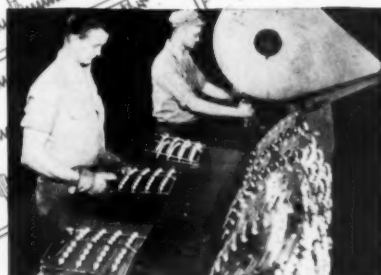


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Inspection of frame slotting operation assures accurate depth control for necessary crossbar "breathing space."



Outer frame gauging and visual cross-bar inspection insure proper squareness in accordance with specs.



Shape gauging inspection is another step in "TEP" quality-control procedure that saves installation time and trouble.



Wire-threading and inspection operations are combined in "TEP" assembly-line procedure.



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- SURE-LOCK INSULATOR SUPPORTS — specially designed by "TEP" eliminate dislocating and subsequent electrical failures.
- SPECIALLY TREATED INSULATORS — reduce micro-amp leakage. "TEP" pioneered porosity-controlled steatite to assure longer life.
- SPECIAL NICKEL PLATING — exclusive "TEP" process assures a chrome-like finish, eliminates corrosion.

## 14-Point Assembly Line Inspection Saves You Time and Trouble

In the manufacture of "TEP" Open-Coil Heating Elements, progressive assembly line inspection has long been employed to assure a top-quality product for appliance manufacturers. As illustrated, "TEP" quality control procedure employs 100% inspection of all units . . . is one of the major reasons why you save time and trouble in assembly and testing. There is a total of 14 inspection operations on the average "TEP-built" heating element. This method also insures maximum economy in manufacturing a quality product. For dependable performance, it pays to specify "TEP".

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